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TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

VOL. XXXI

FOR THE YEAR 1918

Edited by E. Gustav Zinke, M.D., F.A.C.S.
Cincinnati

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AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

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The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

DR. E. GUSTAV ZINKE, *Secretary*,
4 W. Seventh Avenue, Cincinnati.

[Minutes and discussions stenographically reported by William Whitford, Chicago, Ill.]

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

TOGETHER WITH

MINUTES OF THE THIRTY-FIRST ANNUAL MEETING

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

CONSTITUTION.

I. The name of this Association shall be The American Association of Obstetricians and Gynecologists.

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Abdominal Surgery, Obstetrics, and Gynecology.

MEMBERS.

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, Corresponding Fellows, and Senior Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least one month before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least one month before the annual meeting, an original paper relating to Abdominal Surgery, Obstetrics, or Gynecology.

HONORARY FELLOWS.

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS.

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

SENIOR FELLOWS.

Senior Fellows shall be nominated by the Executive Council, and elected by the Association as provided for in the election of Honorary Fellows, and they shall enjoy the same privileges as are accorded Corresponding Fellows.

OFFICERS.

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

"At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

"At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified."[1]

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS.

VII. The time and place of holding the annual meeting shall

[1] Amendment adopted September 21, 1898.

be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

AMENDMENTS.

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided, further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

BY-LAWS.

THE PRESIDING OFFICER.

I. The President, or in his absence, one of the Vice-Presidents shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY.

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

TREASURER.

III. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL.

IV. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS.

V. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A. M.
   - *a*. Reports of Committees on Scientific Questions.
   - *b*. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A. M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's accounts submitted; the reports of Committees on other than scientific subjects offered; and all miscellaneous business transacted.

PAPERS.

VI. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM.

VII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM.

VIII. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE.

IX. Each Fellow, on admission, shall pay an initiation fee of twenty-five dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty dollars annually thereafter.

[A fiscal year includes the period of time between the first day of one annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE.

X. Any Fellow who shall neither attend nor present a paper for five consecutive years, unless he offer a satisfactory excuse, shall be dropped from fellowship, upon vote of the Executive Council.

RULES.

XI. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS.

XII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided*, previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1918–1919

PRESIDENT

JOHN F. ERDMANN, New York

VICE-PRESIDENTS

EDWARD A. WEISS, Pittsburgh
H. WELLINGTON YATES, Detroit

SECRETARY

E. GUSTAV ZINKE, Cincinnati

TREASURER

HERMAN E. HAYD, Buffalo

EXECUTIVE COUNCIL

HUGO O. PANTZER, Indianapolis
ORANGE G. PFAFF, Indianapolis
AARON B. MILLER, Syracuse
JOHN W. KEEFE, Providence
CHARLES L. BONIFIELD, Cincinnati
ALBERT GOLDSPOHN, Chicago

LIST OF OFFICERS.

From the Organization to the Present.

	President.	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1888.	Taylor, Wm. H.	Montgomery, E. E. Carstens, J. H.	Potter, Wm. W.	Werder, X. O.
1889.	Montgomery, E. E.	Myers, W. H. Banta, R. L.	Potter, Wm. W.	Werder, X. O.
1890.	Wright, A. H.	Rohé, G. H. Hall, R. B.	Potter, Wm. W.	Werder, X. O.
1891.	Vander Veer, A.	Hill, H. E. Morris, R. T.	Potter, Wm. W.	Werder, X. O.
1892.	McMurtry, L. S.	Ill, Ed. J. Longyear, H. W.	Potter, Wm. W.	Werder, X. O.
1893.	Rohé, Geo. H.	Manton, W. P. Hulbert, Geo. F.	Potter, Wm. W.	Werder, X. O.
1894.	Carstens, J. H.	Davis, W. E. B. Howitt, H.	Potter, Wm. W.	Werder, X. O.
1895.	Price, Joseph	Cordier, Al. H. Peck, G. S.	Potter, Wm. W.	Werder, X. O.
1896.	Ross, J. F. W.	Johnston, G. B. Sexton, J. C.	Potter, Wm. W.	Werder, X. O.
1897.	Reed, C. A. L.	Douglas, R. Dorsett, W. B.	Potter, Wm. W.	Werder, X. O.
1898.	Ill, Edward J.	Ricketts, Ed. Miller, A. B.	Potter, Wm. W.	Werder, X. O.
1899.	Hall, R. B.	Dunning, L. H. Crofford, T. J.	Potter, Wm. W.	Werder, X. O.
1900.	Davis, W. E. B.	Walker, Ed. Goldspohn, A.	Potter, Wm. W.	Werder, X. O.
1901.	Ricketts, E.	Cumston, C. G. Porter, M. F.	Potter, Wm. W.	Werder, X. O.
1902.	Dunning, L. H.	Rosenwasser, M. Hayd, H. E.	Potter, Wm. W.	Werder, X. O.
1903.	Dorsett, W. B.	Miller, A. B. Haggard, W. D.	Potter, Wm. W.	Werder, X. O.
1904.	Longyear H. W.	Gilliam, D. T. Brown, J. Y.	Potter, Wm. W.	Werder, X. O.
1905.	Brown, J. Y.	West, J. N. Simpson, F. F.	Potter, Wm. W.	Werder, X. O.
1906.	Morris, R. T.	Crile, G. W. Bonifield, C. L.	Potter, Wm. W.	Werder, X. O.
1907.	Zinke, E. G.	Keefe, J. W. Sellman, W. A. B.	Potter, Wm. W.	Werder, X. O.
1908.	Humiston, Wm. H.	Sadlier, J. E. Davis, J. D. S.	Potter, Wm. W.	Werder, X. O.
1909.	Miller, A. B.	Smith, C. N. Huggins, R. R.	Potter, Wm. W.	Werder, X. O.
1910.	Hayd, H. E.	Schwarz, H. Morris, L. C.	Potter, Wm. W.	Werder, X. O
1911.	Werder, X. O.	Frank, L. Tate, M. A.	Zinke, E. G.	Hayd, H. E.
1912.	Porter, M. F.	Smith, C. N. Sadlier, J. E.	Zinke, E. G.	Hayd, H. E.
1913.	Smith, C. N.	Pantzer, H. O. Branham, J. H.	Zinke, E. G.	Hayd, H. E.
1914.	Bonifield, C. L.	Davis, A. B. Sanes, K. I.	Zinke, E. G.	Hayd, H. E.
1915.	Pantzer, H. O.	Dickinson, G. K. Pfaff, O. G.	Zinke, E, G.	Hayd, H. E.
1916.	Keefe, J. W.	Ill, Chas. L. Pfaff, Orange G.	Zinke, E. G.	Hayd, H. E.
1917.	Goldspohn, A.	Bainbridge, W. S. Jones, A. T.	Zinke, E. G.	Hayd, H. E.
1918.	Erdmann, J. F.	Weiss, E. A. Yates, H. W.	Zinke, E. G.	Hayd, H. E.

HONORARY FELLOWS.

1899.—Ballantyne, John William, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of Medicine of the Royal Colleges, Surgeons' Hall, Edinburgh; Physician to the Royal Maternity Hospital, Edinburgh; formerly President of the Edinburgh Obstetrical Society; Examiner in Midwifery in the University of Edinburgh; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 19 Rothesay Terrace, Edinburgh, Scotland.

1889.—Bantock, George Granville, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Broad Meadow, King's Norton, Birmingham, England.

1889.—Barbour, Sir A. H. Freeland, M.A., B.S.C., M.D. F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1889.—Croom, Sir J. Halliday, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Professor of Midwifery in the University of Edinburgh; Consulting Physician to the Royal Infirmary; Physician to the Royal Maternity Hospital; late President of the Royal College of Surgeons, Edinburgh. 25 Charlotte Square, Edinburgh, Scotland.

1891.—Fernandez, Juan Santos, M.D. Prado, No. 105, Havana, Cuba.

1889.—Freund, William Alexander, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1912.—Gilliam, David Tod, M.D. Emeritus Professor of Gynecology, Starling-Ohio Medical College; Gynecologist to St. Anthony Hospital; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine; Honorary Member of the Northwestern Ohio Medical Association; Ex-president, Franklin County Medical Society; *Vice-president*, 1905. 333 East State Street, Columbus, Ohio.

1894.—Jacobs, Charles, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1905.—McGraw, Theodore A., M.D. 73 Cass Street, Detroit, Mich.

1890.—Martin, August, M.D. Emeritus Professor of Gynecology in the University of Greifswald. Keithstrasse 14, Berlin W. 62, Germany.

1897.—Mathews, Joseph McDowell, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; President American Medical Association, 1899; 404 Consolidated Realty Bldg., Los Angeles, Cal.

1910.—de Ott, Dimitrij Oskarovic. Professor of Obstetrics and Gynecology in the Royal Pavloona Clinical Institute of St. Petersburg; President of the Fifth International Congress of Obstetrics and Gynecology. Wassily Ostrow, University Place, Petrograd, Russia.

1891.—Pietranera, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—Schultze, Bernhard Sigmund, M.D. Professor of Gynecology; Director of the Lying-In Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1888.—Williams, Sir John, Bart., M.D., F.R.C.P. Blaen Llynant, Aberystwyth, Cardiganshire, Wales.

Total, fifteen Honorary Fellows.

HONORARY FELLOWS, DECEASED.

1892.—Boisliniere, L. Ch., A.B., M.D., L.L.D., Saint Louis, Mo., 1896.

1890.—Championniere, Just. Lucas, M.D., Paris, France, 1913.

1889.—Charpentier, Louis Arthur Alphonse, M.D., Paris, France, 1899.

1888.—Cordes, Auguste E., M.D., Geneva, Switzerland, 1914.

1890.—Corson, Hiram, M.D., Plymouth Meeting, Pa., 1896.

1889.—Dunlap, Alexander, A.M., M.D., Springfield, O., 1894,

1888.—Edis, Arthur Wellesley, M.D., Lond. F.R.C.S.. M.R.S.C.S., London, England, 1893.

1889.—Eklund, Abraham Fredrik, M.D., Stockholm, Sweden, 1898.

1891.—Fisher, George Jackson, A.M., M.D., Sing Sing, N. Y., 1893.

1896.—Gaston, James McFadden, A.M., M.D., Atlanta, Ga., 1903.

1892.—Green, Traill, M.D., LL.D., Easton, Pa., 1897.

1889.—Keith, Thomas, M.D., London, England, 1896.

1889.—Leopold, G., M.D., Dresden, Germany, 1913.

1894.—Maclein, Donald, M.D., Detroit, Mich., 1903.

1895.—Mastin, Claudius Henry, M.D., LL.D., Mobile, Ala., 1898.

1891.—Moses, Gratz Ashe, M.D., Saint Louis, Mo., 1901.

1905.—Myers, William Herschel, M.D., Fort Wayne, Ind., 1907.

1889.—Nicolaysen, Julius, M.D., Christiania, Norway, 1915.

1889.—Saenger, Max, M.D., Prague, 1903.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng., Birmingham, England, 1907.

1890—Segond, Paul, M.D., Paris, France, 1913.

1899.—Sinclair, Sir William Japp, A.M., M.D., Manchester, England, 1913.

1894.—Slaviansky, Kronid, M.D., St. Petersburg, Russia, 1898.

1888.—Smith, J. Greig, M.A., C.M., M.B., F.R.S.E., Bristol, England, 1897.

1896.—Sternberg, George Miller, A.M., M.D., LL.D., Washington, D. C., 1915.

1899.—Storrs, Melancthon, A.M., M.D., Hartford, Conn., 1900.

1888.—Tait, Lawson, M.D., LL.D., F.R.C.S.E., Birmingham, England, 1899.

1905.—Taylor, William Henry, M.D., *President*, 1888–1889, Cincinnati, Ohio, 1910.

1900.—Thornton, J. Knowsley, M.B., M.C., Cambridge, England, 1904.

1901.—Weber, Gustav C. E., M.D., LL.D., Willoughby, Ohio, 1912.

1889.—Von Winckel, F.M.D., Munich, Germany, 1912.

1905.—Wyman, Walter, M.D., Washington, D.C., 1911.

CORRESPONDING FELLOWS.

1899.—Beuttner, Oscar, M.D. Professor of the Faculty of Medicine; Directeur de la Clinique gynécologique et obstétricale de l'Université de Geneve. Maison Royale, 46, Quai des Eux-Vives, Geneva, Switzerland.

1903.—Crozel, G., M.D. Professor Libre of Gynecology. Collonges au Mont d'Or, Chemin des Celestine, A Oullins, France.

1914.—Das, Kedarnath, M.D. Professor of Midwifery and Gynecology, Campbell Medical School; Obstetrician and Gynecologist, Campbell Hospital, Calcutta; Examiner in Midwifery and Gynecology, Calcutta University; Examiner in Midwifery, College of Physicians and Surgeons, Bengal; Fellow, Royal Society of Medicine, London. 22, Bethune Row, Calcutta.

1903.—Ellis, Guilherme, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—Griffin, Herbert Spohn, B.A., M.B., M.D., C.M. Surgeon to St. Joseph's Hospital; Gynecologist to Hamilton City Hospital; 157 Main Street, Hamilton, Ontario, Canada.

1914.—Hertoghe, Eugene, M.D. Antwerp, Belgium.

1903.—Lane, Horace Manley, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—Machell, Henry Thomas, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—Wright, Adam Henry, B.A., M.D. Univ. Toronto, M.R.C.S., Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President*, 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, nine Corresponding Fellows.

SENIOR FELLOWS.

1911.—Lincoln, Walter Rodman, B.A., M.D. Lecturer on Gynecology, College of Physicians and Surgeons of Cleveland. Lennox Building, corner Erie Street and Euclid Avenue, Cleveland, Ohio.

1915.—Lyons, John Alexander, M.D., F.A.C.S. Instructor in Gynecology at the Post-Graduate Medical School; Gynecologist and Lecturer to Nurses at the Chicago Hospital. Residence, 6348 Anthony Avenue; Office, 850 Wilson Avenue, Chicago, Ill.

1917.—Sutcliffe, John Asbury, A.M., M.D., Capt., M.R.C., U. S. Army. Professor of Genito-urinary Surgery, Indiana University School of Medicine; Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genito-urinary Diseases to the City Hospital and to the Protestant Deaconess' Hospital. Residence, 1121 Central Avenue; Office, 155 East Market Street, Indianapolis, Ind.

1917.—Howitt, Henry, M.D. M.R.C.S. Eng., F.A.C.S. Senior Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph. Member of the British, Canadian and Ontario Medical Associations. President of the Guelph Association. Vice-president, 1895. 221 Woolwich St., Guelph, Ontario, Canada.

ORDINARY FELLOWS.

1895.—Bacon, Joseph Barnes, M.D., F.A.C.S. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago; Surgeon in Chief St. Francis Hospital, Macomb, Ill.

1911.—Bainbridge, William Seaman, M.D., A.M., LL.D., M.S., C.M., Sc.D., Lieut. Com., M.C., U.S.N. Adjunct Professor, New York Post-Graduate Medical School, 1902–6; Professor New York Polyclinic Medical School and Hospital since 1906; Surgeon, New York Skin and Cancer Hospital; Attending Surgeon, New York City Children's Hospitals and Schools; Consulting Surgeon, Manhattan State Hospital, New York Home for Dependent Crippled Children, College of Dental and Oral Surgery of New York and Tarrytown Hospital, Tarrytown, N. Y.; Consulting Gynecologist, St. Andrew's Hospital (New York) and St. Mary's Hospital, Jamaica, Long Island and the Ossining Hospital, Ossining, N. Y.; Honorary President International Congress for Study of Tumors and Cancers, Heidelberg, Germany, 1906. 34 Gramercy Place, New York City.

1895.—Baldwin, James Fairchild, A.M., M.D., F.A.C.S. Memb. Volunteer M.C.; Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—Bandler, Samuel Wyllis, M.D., F.A.C.S. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. Residence and Office, 134 West Eighty-seventh Street, New York, N. Y.

1911.—Barrett, Channing W., M.D., F.A.C.S. Professor of Gynecology and Head of Division of Gynecology, University of Illinois Medical School, Gynecologist and Head of Department of Gynecology, Cook County Hospital. 561 Stratford Pl., Chicago, Ill.

1913.—Baughman, Greer, M.D., Capt., M.C., U. S. Army. Professor of Obstetrics, Medical College of Virginia; Visiting Ob-

stetrician to the Stuart Circle Hospital and to the Memorial Hospital, Richmond, Virginia; Member of the Southern Surgical and Gynecological Association; Vice-President of the Medical Society of Virginia, 1905; Member of the Tri-State Medical Association of Virginia and the Carolinas; Richmond Academy of Medicine and Surgery and the American Medical Society. Residence and Office, 26 North Laurel St., Richmond, Virginia.

1907.—Bell, John Norval, M.D., F.A.C.S., Capt., M.C., U. S. Army. Associate Professor of Obstetrics, Detroit College of Medicine and Surgery; Attending Obstetrician, Harper Hospital; Consultant in Obstetrics, Woman's Hospital. Residence, 203 Pallister Avenue; Office, 1149 David Whitney Bldg., Detroit, Mich.

1914.—Bill, Arthur Holbrook, A.M., M.D. Associate Professor of Obstetrics, School of Medicine, Western Reserve University; Visiting Obstetrician to the Maternity Hospital of Cleveland; Visiting Obstetrician and Head of the Department, Cleveland City Hospital; Obstetrician in charge of Out-patient Obstetrical Department, Western Reserve University. Residence, 2083 East 96th St.; Office, 1021 Prospect Ave., Cleveland, O.

1900.—Bonifield, Charles Lybrand, M.D. Professor of Gynecology, Medical Department of the University of Cincinnati. Member and Ex-President, Cincinnati Academy of Medicine, Cincinnati Obstetrical Society, Ohio State Medical Association and Ohio Clinical Association. Member of American Medical Association, Southern Surgical and Gynecological Society. *President*, 1914. Residence, 1763 East McMillan Street; Office, 409 Broadway, Cincinnati, Ohio.

1896.—Bosher, Lewis C., M.D., F.A.C.S. Professor of Practice of Surgery and Clinical Surgery, Medical College of Virginia; Visiting Surgeon, Memorial Hospital, Richmond. 422 East Franklin Street, Richmond, Va.

Founder.—Boyd, James Peter, A.M., M.D. Emeritus Professor of Obstetrics and Diseases of Children in the Albany Medical College; Consulting Obstetrician and Gynecologist to the Albany Hospital; Fellow of the British Gynecological Society; Fellow of the Royal Society of Medicine. 152 Washington Avenue, Albany, N. Y.

1889.—Branham, Joseph H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1912.—Brown, George Van Amber, M.D. Gynecologist to Providence Hospital; Clinical Instructor in Gynecology, Detroit College of Med. and Surg.; Member Wayne Co. and Michigan State Med. Soc.; Member American Medical Association; President Northern Tri-State Med. Soc. 1918. Residence, 55 Gladstone Avenue; Office, 919 J. Henry Smith Building, Detroit, Mich.

1894.—Brown, John Young, M.D., F.A.C.S. Professor of Clinical Surgery in Saint Louis University; Chief Surgeon to St. John's Hospital; President of the Mississippi Valley Medical Association, 1898; *Vice-president*, 1905; *President*, 1906; *Executive Council*, 1907–8. Residence, 303 North Grand Avenue; Office, 612 Metropolitan Building, Saint Louis, Mo.

1914.—Brown, William Mortimer, M.D., F.A.C.S. Obstetrician to Rochester General Hospital. Residence and Office, 1776 East Ave., Rochester, N. Y.

1918.—Burckhardt, Louis, M.D. Professor of Obstetrics, Indiana University. Residence, 3159 North Pennsylvania Street; Office, 621 Hume-Mansur Building, Indianapolis, Ind.

1908.—Buteau, Samuel H., M.D., F.A.C.S. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office, 1155 Broadway, Oakland, Cal.

Founder.—Carstens, J. Henry, M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor Abdominal and Pelvic Surgery, Detroit College of Medicine and Surgery, President of the Faculty. Consulting Gynecologist to the Harper Hospital; Cons. Obstetrician to the Woman's Hospital; Consulting Obstetrician to the House of Providence; Ex-President Michigan State Medical Society; Ex-President Mississippi Valley Medical Society; Ex-Chairman Section of Obstetrics, A. M. A.; Member Royal Society of Medicine; Member American College of Surgeons, etc., etc. President of the Detroit Gynecological Society, 1892. *Vice-president*, 1888–89; *President*, 1895; *Executive Council*, 1896–98. 1447 David Whitney Building, Detroit, Mich.

1914.—Chandler, George Fletcher, M.D., F.A.C.S., Maj., M.C., U. S. Army. Surgeon to the Kingston City Hospital. Residence and Office, 11 East Chestnut St., Kingston, N. Y.

1915.—Clark, Edmund Dougan, M.D., F.A.C.S. Professor of Surgery and Secretary of the Faculty, Indiana University School of Medicine. Residence, 1236 New Jersey Street; Office, Hume-Mansur Building, Indianapolis, Ind.

1901.—Crile, George W., A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Senior Consultant in Surgical Research, American Expeditionary Forces; Professor of Surgery, Western Reserve Medical College; Visiting Surgeon to Lakeside Hospital. *Vice-president*, 1907. Residence, 2620 Derbyshire Road, Cleveland Heights; Office, Osborn Bldg., Cleveland, Ohio.

1905.—Crossen, Harry Sturgeon, M.D., F.A.C.S. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. Residence, 4477 Delmar Avenue; Office, 310 Metropolitan Building, Saint Louis, Mo.

1912.—Crotti, André, M.D., F.A.C.S. Capt., M.C., U. S. Army. Professor of Clinical Surgery, Ohio State University; Surgeon to Grant Hospital, Children's Hospital and to St. Francis Hospital. Residence, 1728 E. Broad Street; Office, 151 E. Broad Street, Columbus, Ohio.

1912.—Darnall, William Edgar, A.B., M.D., F.A.C.S. Gynecologist, Atlantic City Hospital; Consulting Surgeon to North American Children's Sanitarium for the Treatment of Surgical Tuberculosis, and Home for Incurables, Longport, New Jersey. *Vice-president* American Medical Association, 1914. Residence and Office, 1704 Pacific Ave., Atlantic City, N. J.

1911.—Davis, Asa Barnes, M.D., F.A.C.S. Attending Surgeon of the Society of the Lying-in Hospital of the City of New York; Consulting Gynecologist to the Vassar Brothers' Hospital, Poughkeepsie, N. Y. 42 E. 35th Street, New York.

1915.—Davis, James Ethelbert, M.D. Attending Surgeon, Providence Hospital, Detroit; Chief of Staff, Salvation Army Maternity Hospital, Detroit; Associate Professor of Surgery, Detroit College of Medicine and Surgery. Residence, 831 West Fort Street; Office, 1229 David Whitney Building, Detroit, Mich.

1903.—Davis, John D. S., M.D., LL.D., F.A.C.S. Professor of Surgery in the Post-Graduate School of Medicine of the University of Alabama; Surgeon to Hillman Hospital; Surgeon to Davis Infirmary; ex-President Jefferson County Medical Society; *Vice-president*, 1905; *Vice-president*, 1909. 2031 Avenue G, Birmingham, Ala.

1910.—Dice, William Gordon, A.B., M.D. Obstetrician to Flower Hospital. 240 Michigan Street, Toledo, Ohio.

1909.—Dickinson, Gordon K., M.D., F.A.C.S. Surgeon to the City and Christ Hospitals; Consulting Surgeon to Bayonne Hospital. Consulting Surgeon, Stumpf Memorial Hospital, Kearny, N. J. 280 Montgomery Street, Jersey City, N. J.

1899.—Eastman, Thomas Barker, A.B., M.D., F.A.C.S. Professor of the Medical and Surgical Diseases of Women, Central College of Physicians and Surgeons; Gynecologist to the City Hospital, City Dispensary, and Central Free Dispensary. 309 Pennway Building, Indianapolis, Ind.

1904.—Elbrecht, Oscar H., Ph.B., M.D., F.A.C.S. Formerly Superintendent and Surgeon in Charge, St. Louis Female Hospital; Visiting Surgeon, St. Louis City Hospital; Consulting Gynecologist, Missouri Pacific Hospital; Consulting Surgeon to St. Louis Maternity Hospital and former Chief of Staff; Consulting Surgeon, Bethesda Hospital; Member of Southern Surgical and Gynecological Association. Residence, Buckingham Hotel; Office, 423 Metropolitan Building, St. Louis, Mo.

1906.—Erdmann, John Frederick, M.D., F.A.C.S. Professor of Surgery, N. Y. Post-Graduate Hospital and Medical School; Attending Surgeon to Gouverneur Hospital and Post-Graduate Hospital; Consulting Surgeon to St. John's Riverside Hospital, Yonkers, N. Y.; Mt. Vernon General Hospital, Mt. Vernon, N. Y.; Greenwich General Hospital, Greenwich, Conn.; Nassau Hospital, Mineola, L. I. 60 West Fifty-second Street, New York, N. Y.

1911.—Findley, Palmer, B.E., M.D., F.A.C.S. Professor of Gynecology, College of Medicine, University of Nebraska. 418 Brandeis Theater Building, Omaha, Neb.

1910.—Foster, Curtis Smiley, A.B., M.D., F.A.C.S. Gynecologist to the Western Pennsylvania Hospital, Pittsburgh. Residence, 5749 Ellsworth Avenue; Office, 308 Diamond Bank Building, Pittsburgh, Pa.

1903.—Frank, Louis, M.D., F.A.C.S. Professor of Abdominal and Pelvic Surgery, Medical Department, University of Louisville;

Surgeon Louisville City Hospital; Surgeon to John N. Norton Memorial Infirmary; President Mississippi Valley Medical Association, 1912; *Executive Council*, 1913. Residence, 1321 Fourth Ave.; Office, 400 The Atherton, Louisville, Kentucky.

1912.—Furniss, Henry Dawson, M.D., F. A. C. S., Capt., M.C., U. S. Army; Professor of Gynecology, New York Post-Graduate Hospital; Assistant Attending Gynecologist New York Post-Graduate Medical School and Hospital; Consulting Gynecologist, Volunteer Hospital; Consulting Gynecologist, New Rochelle Hospital; Consulting Gynecologist St. Agnes Hospital, White Plains, N. Y.; Fellow New York Academy of Medicine, New York Medico-Surgical Society, New York Obstetrical Society, New York State and County Medical Societies, American Medical Association, American Urological Society. Residence, 393 West End Ave.; Office, 375 West End Avenue, New York, N. Y.

1902.—Gillette, William J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—Goldspohn, Albert, M.S., M.D., F.A.C.S. Professor of Gynecology, Post-Graduate Medical School; Surgeon in Chief of Evangelical Deaconess Hospital. *Vice-president*, 1901. Residence, 2118, Office, 2120 Cleveland Avenue, Chicago, Ill.

1913.—Hadden, David, B.S., M.D., F.A.C.S. Residence, 6150 Mendocino Ave.; Office, Oakland Bank of Savings Bldg., Oakland, Cal.

1900.—Haggard, William David, Jr., M.D., F.A.C.S. Professor of Gynecology, Medical Department University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and President) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Woman's Hospital, N. Y. *Vice-president*, 1904. 148 Eighth Avenue, North, Nashville, Tenn.

1906.—Hall, Joseph Arda, M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Clinical Assistant in Gynecology at the Miami Medical College, Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—Hall, Rufus Bartlett, A.M., M.D., F.A.C.S. Professor of Clinical Gynecology in the Ohio-Miami Medical College, Medical Department of University of Cincinnati; Gynecologist to the Cincinnati Hospital; Surgeon in charge of the Hall Hospital; Member of the British Medical Society; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine (President, 1909); of the Cincinnati Obstetrical Society (Ex-President). *Vice-president*, 1891; *President*, 1900; *Executive Council*, 1904–1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—Hamilton, Charles Sumner, A.B., M.D., F.A.C.S. Professor of the Principles of Surgery in Starling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 142 South Garfield Street, Columbus, Ohio.

1910.—Harrar, James Aitken, M.D., F.A.C.S. Attending Surgeon to the Lying-in Hospital of the City of New York. Residence and Office, 108 East 64th Street, New York, N. Y.

1894.—Hayd, Herman Emil, M.D., M.R.C.S. Eng., F.A.C.S. Surgeon to the German Deaconess Hospital; Surgeon to the German Hospital. *Vice-president*, 1903; *Executive Council*, 1908–1910; *President*, 1911. 493 Delaware Avenue, Buffalo, N. Y.

1908.—Hedges, Ellis W., A.B., M.D., F.A.C.S. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

1910.—Hill, Ira Leon, A.B., M.D. Clinical Instructor of Obstetrics at Cornell University Medical College; Visiting Obstetrician to the Red Cross Hospital; Attending Obstetrician to Sydenham Hospital. 616 Madison Avenue, New York, N. Y.

1905.—Huggins, Raleigh Russell, M.D., F.A.C.S. Surgeon to St. Francis Hospital. *Vice-president*, 1910. 1018 Westinghouse Building, Pittsburgh, Pa.

1895.—Humiston, William Henry, M.D. Clinical Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical Society, 1898. *Executive Council*, 1902–1903, 1908, 1910–1911. *President*, 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1901.—Ill, Charles L., M.D., F.A.C.S. Surgeon to the German Hospital; Gynecologist to St. Michael's and Surgeon to St. Barnabas's Hospitals; Newark; Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—Ill, Edward Joseph, M.D., F.A.C.S. Surgeon to the Woman's Hospital; Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the German Hospital and the Bnoth Israel Hospital of Newark, N. J., to All Souls' Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president*, 1893; *President*, 1899; *Executive Council*, 1901–1903. 1002 Broad Street, Newark, N. J.

1909.—Jacobson, Julius H., M.D., F.A.C.S. Professor of Gynecology and Clinical Surgery, Medical Department Toledo University; Surgeon to Lucas City Hospital; Gynecologist to St. Vincent's Hospital, Toledo. 2050 Franklin Street, Toledo, O.

1906.—Jonas, Ernst, M.D., F.A.C.S. Clinical Professor of Surgery in Washington University Medical School; Surgeon in Charge of the Surgical Clinic at the Washington University Hospital; Gynecologist to the St. Louis Jewish Hospital; Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Martha Parsons Free Hospital for Children. Residence, 4495 Westminster Place; Office, 465 North Taylor Avenue, St. Louis, Mo.

1910.—Jones, Arthur Thoms, M.D., F.A.C.S. Visiting Surgeon to Memorial Hospital, Pawtucket, R. I. and to Rhode Island State Hospital for the Insane, Howard, R. I; Visiting Surgeon to St. Joseph's Hospital, Providence; and to Woonsocket Hospital, Woonsocket, R. I. Residence, 81 Elm Grove Avenue; Office, 131 Waterman St., Providence, R. I.

1902.—Keefe, John William, M.D., L.L.D., F.A.C.S. Attending Surgeon to the Rhode Island Hospital and Providence City Hospital; Consulting Surgeon to the St. Joseph's Hospital, Providence Lying-In Hospital, Memorial Hospital, Pawtucket and Woon-

socket Hospital. *Vice-president*, 1908. *Executive Council*, 1911. 262 Blackstone Boulevarde, Providence, R. I.

1910.—Kennedy, James W., M.D., F.A.C.S. Associate Gynecologist and Obstetrician to the Philadelphia Dispensary. 1409 Spruce Street, Philadelphia, Pa.

1911.—King, James E., M.D., F.A.C.S. Professor of Clinical Gynecology, Medical Department, University of Buffalo, New York; Attending Gynecologist, Buffalo General and Erie County Hospital and Good Samaritan Dispensary; Fellow Royal Society of Medicine, London, England; Fellow of Am. Gyn. Soc. 1248 Main Street, Buffalo, N. Y.

1908.—Kirchner, Walter C. G., A.B., M.D., F.A.C.S., Capt., M.C., U. S. Army. Formerly Superintendent and Surgeon in charge of the St. Louis City Hospital. Visiting Surgeon City Hospital, Consulting Surgeon St. John's Hospital. Office, 508 Metropolitan Building, St. Louis, Mo.

1918.—Kosmak, George William, A.B., M.D., F.A.C.S. Attending Surgeon, New York Lying-in Hospital; Editor, American Journal of Obstetrics, and Bulletin of New York Lying-in Hospital. Residence and Office, 23 East Ninety-third Street, New York, N. Y.

1898.—Langfitt, William Sterling, M.D., F.A.C.S. Surgeon in chief to St. John's Hospital. Office, 8047 Jenkins Building, Pittsburgh, Pa.

1914.—Leighton, Jr., Adam P., L. M. (Dublin), M.D., Asst. Surg., Lieut., M.C., U. S. N. Assistant in Gynecology, Bowdoin Medical School; Superintendent and Owner, Dr. Leighton's Maternity Hospital, Portland; Gynecologist to Edward Mason Dispensary, Portland; Member, State Board of Registration of Medicine. Residence and Office, 192 State Street, Portland, Me.

1915.—Litzenberg, Jennings, A.B., M.D., F.A.C.S. Professor of Gynecology and Obstetrics, University of Minnesota. Residence, 3137 Park Avenue; Office, Donaldson Building, Minneapolis, Minn.

1890.—Longyear, Howard Williams, M.D., F.A.C.S. Professor of Gynecology and Abdominal Surgery in the Detroit Post-Graduate Medical School; Clinical Professor of Gynecology in the Detroit College of Medicine; Gynecologist to Harper Hospital; Physician

to the Woman's Hospital; President of the Detroit Gynecological Society, 1889; President of the Detroit Surgical Society; Chairman of the Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892; Chairman Section of Obstetrics and Gynecology and Abdominal Surgery of the American Medical Association 1917. *Vice-president*, 1893; *President*, 1905; *Executive Council*, 1906–1908. Residence, 1699 Jefferson Avenue; Office, 32 Adams Avenue W., Detroit, Mich.

1911.—Lothrop, Earl P., A.B., M.D., F.A.C.S. Gynecologist to the Buffalo Woman's Hospital; Consulting Surgeon to Columbus Hospital, Buffalo; Surgeon to the J. N. Adam Memorial Hospital for Tuberculosis, Perrysburg, N. Y. 153 Delaware Avenue, Buffalo, N. Y.

1910.—Lott, Henry Stokes, M.D. 123 Cherry Street, Winston, N. C.

1913.—Lynch, Jerome Morley, M.D., F.A.C.S. Professor Rectal and Intestinal Diseases, New York Polyclinic; Consulting Surgeon Nassau Hospital, Mineola, L. I.; Attending Surgeon St. Mary's Hospital, Hoboken, N. J.; Member New York State and County Societies, American Medical Association, American Proctologic Society, North Western Medical and Surgical Society; Surgeon Medical Reserve, U. S. N. Residence and Office, 57 East Fifty-second St., New York City.

1910.—McClellan, Benjamin Rush, A.B., A.M., M.D., F.A.C.S. Capt., M.C., U. S. Army, Member American Medical Association; ex-President Ohio State Medical Society; Surgeon to McClellan Hospital. Residence, 636 South Detroit Street; Office, 7 East Second Street, Xenia, Ohio.

1910.—McPherson, Ross, A.B., M.D., F.A.C.S. Attending Surgeon of the Lying-in Hospital of the City of New York; Consulting Obstetrician of the Caledonian Hospital in Brooklyn. Office, 125 East Thirty-ninth Street; Residence, 45 East Sixty-second Street, New York, N. Y.

Founder.—Manton, Walter Porter, M.D., F.A.C.S. Head of Department and Professor of Obstetrics and Clinical Gynecology, Detroit College of Medicine and Surgery; Gynecologist to Harper Hospital and the Pontiac and Traverse City State Hospitals; Con-

sulting Gynecologist to St. Joseph's Retreat; Formerly President of the Medical Board and Visiting Obstetrician Woman's Hospital and Infants' Home; President Detroit Academy of Medicine, 1892–1894; President Detroit Gynecological Society, 1890; President Wayne County Medical Society, 1908–1909; Chairman, Section on Obstetrics and Diseases of Women, 1909; Fellow of the Royal Medical Society, the American Gynecological Society, the American College of Surgeons; the Zoological Society of London, etc. *Vice-president*, 1894. 32 Adams Avenue, W., Detroit, Mich.

1911.—Marvel, Emery, M.D., F.A.C.S. Chief Surgeon and Gynecologist, Private Hospital Association, Atlantic City; Consulting Surgeon and Gynecologist, Jewish Seashore Home, Atlantic City, 1801 Pacific Avenue, Atlantic City, N. J.

1914.—Meeker, Harold Denman, A.B., M.D., Lieut. Com., M.C., U. S. N. Adjunct Professor of Surgery, Polyclinic Medical School and Hospital, New York; Visiting Surgeon to New York Red Cross Hospital. Residence and Office, 420 West End Avenue, New York, N. Y.

Founder.—Miller, Aaron Benjamin, M.D., F.A.C.S. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital; Consulting Gynecologist to Hospital for Women and Children; Gynecologist to Dispensary. *Vice-president*, 1899, 1904; *President*, 1910; *Executive Council*, 1911. 326 Montgomery Street, Syracuse, N. Y.

1905.—Miller, John D., M.D., F.A.C.S. Clinical Professor of Gynecology, University of Cincinnati; Assistant Director of Gynecologic Clinic, Cincinnati General Hospital; Gynecologist of Good Samaritan and Cincinnati General Hospitals. Residence, N. E. cor. Clifton and McMillan Streets; Office, N. W. cor. Eighth and Elm Streets, Cincinnati, Ohio.

1911.—Moots, Charles W., B.S., M.D., F.A.C.S. Lt. Commander, U. S. N. Gynecologist to Flower Hospital; President of Academy of Medicine of Toledo and Lucas County, 1912. Residence, River Road, R.F.D. No. 4; Office, 347 The Nicholas, Toledo, Ohio.

1907.—Moriarta, Douglas C., M.D., F.A.C.S. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christian Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1904.—Morris, Lewis Coleman, M.D., F.A.C.S. Professor of Gynecology and Abdominal Surgery in the Birmingham Medical College; Secretary, Medical Association State of Alabama, 1904; Member of Jefferson County Board of Health. *Vice-president*, 1911. 1203 Empire Building, Birmingham, Ala.

1890.—Morris, Robert Tuttle, A.M., M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1892; *Executive Council*, 1906, 1908–1911; *President*, 1907. 616 Madison Avenue, New York, N. Y.

1918.—Mosher, George Clark, A.M., M.D., F.A.C.S. President, Jackson County Medical Society; Chairman, Kansas City Medical Society; Consulting and Senior Attending Obstetrician of the Kansas City General and Christian Hospitals. Residence, 361 Locust Street; Office, 605 Bryant Building, Kansas City, Mo.

1896.—Noble, George Henry, M.D. F.A.C.S. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1903.—Noble, Thomas Benjamin, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 720 Newton Claypool Building, Indianapolis, Ind.

1907.—Olmsted, Ingersoll, M.D., F.A.C.S. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1899.—Pantzer, Hugo Otto, A.M., M.D., F.A.C.S., Past Professor, Surgical Pathology and Clinical Gynecology, in the Central College of Physicians and Surgeons; Past Professor Clinical Gynecology, Indiana Medical College, Medical Department of Purdue University; Late Professor of Clinical Gynecology in the Indiana Medical college, Medical Department of Indiana University; Gynecologist to Methodist Hospital; Past President of Indianapolis Medical Society; Member of Indiana State Association and American Medical Association. *President* 1915. 601 Hume-Mansur Bldg., Indianapolis, Ind.

1916.—Peck, George Augustus, M.D., Attending Surgeon, New Rochelle Hospital, New Rochelle, N. Y.; Consulting Surgeon, Westchester County Hospital, New York. Residence and Office 189 Centre Ave., New Rochelle, N. Y.

1916.—Percy, James Fulton, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Residence 593 East Losey St.; Office, 147 South Cherry St., Galesburg, Ill.

1899.—Pfaff, Orange G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals. 1337 North Pennsylvania Street, Indianapolis, Ind.

1898.—Porter, Miles F., M.D., F.A.C.S., Chairman of the District Conscript Board No. 2, of Indiana. Professor of Surgery in the Indiana University School of Medicine; ex-President Indiana State Medical Society. *Vice-president*, 1902; *President*, 1912–1913. 2326 Fairfield Ave., Fort Wayne, Ind.

1914.—Potter, Irving White, M.D. Attending Obstetrician, St. Mary's Maternity Hospital, Assistant Obstetrician, Buffalo General Hospital; Attending Obstetrician, German Deaconess Hospital. Residence and Office, 420 Franklin St., Buffalo, N. Y.

1903.—Poucher, John Wilson, M.D., F.A.C.S. Consulting Surgeon to Vassar Brothers Hospital, Poughkeepsie. 339 Mill Street, Poughkeepsie, N. Y.

1904.—Reder, Francis, M.D., F.A.C.S. Surgeon to Missouri Baptist Sanitarium; Surgeon to St. John's Hospital; Visiting Surgeon to St. Louis City Hospital, and allied Institutions. Residence, 6346 Berlin Avenue; Office, 518–519 Delmar Building, St. Louis, Mo.

Founder.—Reed, Charles Alfred Lee, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Consulting Gynecologist, Cincinnati General Hospital; President, American Medical Association, 1900–1; Fellow, British Gynecological Society; Foundation member International Periodical Congress of Gynecology and Obstetrics; Cheva-

lier Legion of Honor, France; Fellow, National Academy of Medicine of Peru; President, Seventh Pan-American Medical Congress. *President*, 1898. Residence, 3544 Biddle Avenue; Office, 5 West Eighth Street, Cincinnati, Ohio.

1913.—Rongy, Abraham Jacob, M.D., F.A.C.S. Attending Gynecologist, Lebanon Hospital; Attending Surgeon, Jewish Maternity Hospital; Consulting Gynecologist, Rockaway Beach Hospital. Residence and Office, 62 West 89th Street, New York City.

1909.—Rosenthal, Maurice I., M.D., F.A.C.S. Surgeon to Saint Joseph's Hospital. 336 W. Berry Street, Fort Wayne, Ind.

1902.—Runyan, Joseph Phineas, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. State Bank Bldg., Little Rock, Ark.

1906.—Ruth, Charles Edward, M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon Iowa M. E. Hospital; Surgeon to Wabash Railway; Chief of Surgical Base Hospital, Camp Dodge, Ia. Surgeon to the Chicago and Rock Island Pacific Railway. Equitable Bldg., Des Moines, Iowa.

1903.—Sadlier, James Edgar, M.D., F.A.C.S. Attending Surgeon, St. Francis Hospital, Poughkeepsie, N. Y.; Surgeon-In-Chief, The Sadlier Hospital, Poughkeepsie, N. Y.; Consulting Surgeon, Highland Hospital, Beacon, N. Y. *Vice-president*, 1909. Residence and Office, 295 Mill Street, Poughkeepsie, N. Y.

1909.—Sanes, Kay Isadore, M.D., F.A.C.S., Capt., M.C., U. S. Army. Gynecologist to the West Penn Hospital; Consulting Gynecologist to the Montefiore Hospital, Pittsburgh. Residence, 234 McKee Place; Office, Jenkins Building, Pittsburgh, Pa.

1910.—Schildecker, Charles Bushfield, M.D. Assistant Gynecologist to Western Pennsylvania Hospital; Coroner's Physician of Allegheny County. Residence, 414 Rebecca Street; Office, 1105 Park Building, Pittsburgh, Pa.

1904.—Schwarz, Henry, M.D., F.A.C.S. Professor of Obstetrics, Medical Department of Washington University. *Vice-president*, 1911. 440 North Newstead Avenue, St. Louis, Mo.

1918.—Schwarz, Otto H., M.D. Instructor in Clinical Obstetrics, Washington University School of Medicine. Residence, 4947 Laclede Avenue; Office, 820 University Club Building, St. Louis, Mo.

1901.—Scott, N. Stone, A.M., M.D., F.A.C.S. Formerly Dean and Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. Residence, 531 Prospect Avenue; Office, 603–605 Citizens' Building, Cleveland, Ohio.

1895.—Sellman, William Alfred Belt, M.D. Gynecologist to The Biedler and Sellman Sanitarium; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore City Medical Society; also of the American Medical Association; the Gynecological and Obstetrical Association of Baltimore; Physician to The Margaret J. Bennett Home for Young Ladies. *Vice-president*, 1908; *Executive Council*, 1909–1910. 5 East Biddle Street, Baltimore, Maryland.

1899.—Simpson, Frank Farrow, A.B., M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Chief Medical Section, Council of National Defense; Chief Section of Medical Industry. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president*, 1906. Jenkins Building, Pittsburgh, Pa.

1912.—Skeel, Arthur Julius, M.D., F.A.C.S. Assistant Professor of Obstetrics, Western Reserve University; Obstetrician to St. Luke's Hospital; Consulting Obstetrician to the Florence Crittenden Home; Consulting Obstetrician to the Woman's Hospital. Residence and Office, 1834 East 65th Street, Cleveland, Ohio.

1901.—Skeel, Roland Edward, M.D., F.A.C.S., Major, M.C., U. S. Army. Associate Clinical Professor of Gynecology in Western Reserve University; Gynecologist to St. Luke's, City, and Lutheran Hospitals; Consulting Surgeon to the Lakewood Hospital. 314 Osborn Building, Cleveland, Ohio.

1910.—Smead, Lewis Frederic, A.B., M.D., F.A.C.S. Surgeon to St. Vincent's Hospital, Toledo. Residence, 2921 Parkwood Avenue; Office, 242 Michigan Street, Toledo, Ohio.

1891.—Smith, Charles North, M.D., F.A.C.S. Surgical Chief of Flower Hospital; Gynecologist to St. Vincent's Hospital; *Vice-president*, 1910. 234 Michigan Street, Toledo, Ohio.

1904.—Smith, William S., M.D. Professor of Gynecology in the Maryland Medical College; Gynecologist to Franklin Square Hospital. 528 Hanover Street, Baltimore, Md.

1902.—Stark, Sigmar, M.D., F.A.C.S. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, Ohio.

1908.—Stewart, Douglas Hunt, M.D., F.A.C.S. Surgeon O. P. D. Knickerbocker Hospital. Residence, 128 West 6th Street, New York, N. Y.

1911.—Stillwagen, Charles A., M.D., F.A.C.S. Office, Highland Bldg.; Residence, 5343 Pennsylvania Avenue, Pittsburgh, Pa.

1914.—Strasser, August Adrian, M.D., F.A.C.S., 1st Lieut., M.R.C., U. S. Army. Surgeon, Stumpf Memorial Hospital, Kearny, N. J.; Assistant Surgeon of the Woman's Hospital, St. Michaels Hospital, Newark, N. J.; Adjunct Surgeon, St. James Hospital, Newark, N. J. Residence and Office, 115 Beech St., Arlington, N. J.

1899.—Swope, Lorenzo W., M.D., F.A.C.S. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburgh Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Society; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburgh, Pa.

1901.—Tate, Magnus Alfred, M.D., F.A.C.S. Professor of Obstetrics Miami Medical College; President Cincinnati Academy of Medicine, 1905; Obstetrician to the Cincinnati General Hospital and to the Good Samaritan Hospital. 19 West Seventh Street, Cincinnati, Ohio.

1908.—Torrance, Gaston, M.D. Surgeon to St. Vincent's and the Hillman Hospitals in Birmingham. Residence, 2705 Caldwell Avenue; Office, 325 Woodward Building, Birmingham, Ala.

1917.—Tovey, David William, M.D. Adjunct Professor of Gynecology, N. Y. Polyclinic Medical School; Gynecologist N. Y. Polyclinic Hospital; Gynecologist Harlem Dispensary. Residence and Office, 240 Riverside Drive, New York, N. Y.

Founder.—Vander Veer, Albert, A.M., M.D., Ph.D., LL.D., F.A.C.S., Member Volunteer M.C. Five years Professor of Anatomy, Thirty-eight years Professor of Surgery, Albany Medical College; Surgeon-in-Chief, Albany Hospital; Consulting Surgeon, South End Dispensary; Consulting Surgeon, Benedictine Hospital, Kingston, N. Y.; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y.; Consulting Surgeon, Crippled and Ruptured Children, West Haverstraw, N. Y.; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the American Medical Association (First Vice-president and President, 1915); Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society; Vice-Chancellor of the Board of Regents of the University of the State of New York. *Executive Council*, 1889–1891, 1895–1905; *President*, 1892. 28 Eagle Street, Albany, N. Y.

1913.—Vander Veer, Edgar Albert, Ph.D., M.D., F.A.C.S. Attending Surgeon Albany Hospital; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y. Residence, 150 State St.; Office, 28 Eagle St., Albany N. Y.

1912.—Van Sweringen, Budd, M.D., Maj., M.R.C., U. S. Army. Gynecologist to the Lutheran Hospital, Surgeon to Pennsylvania Railroad; Formerly Professor of Medicine, Ft. Wayne College of Medicine. 208 Washington Boulevard, Fort Wayne, Indiana.

1909.—Wade, Henry Albert, M.D., F.A.C.S. Visiting Surgeon to Bethany Deaconess's Hospital; Attending Gynecologist to Williamsburg Hospital, Brooklyn. 495 Greene Avenue, Brooklyn, N. Y.

1909.—Waldo, Ralph, M.D., F.A.C.S. Gynecologist to Lebanon Hospital; Associate Surgeon to the Woman's Hospital of the State of New York; Consulting Obstetrician, Jewish Maternity Nyack Hospital and Rockaway Beach Hospital. 54 W. 71st Street, New York, N. Y.

1891.—Walker, Edwin, M.D., Ph.D., F.A.C.S. Surgeon to the Walker Hospital; Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president*, 1901. 712 South Fourth Street, Evansville, Ind.

1907.—Weiss, Edward Aloysius, M.D., F.A.C.S., Lieut. Com., M.C., U. S. N. Gynecologist to Mercy Hospital; Gynecologist to Presbyterian Hospital; Obstetrician to Rosalia Maternity Hospital; Assistant Professor of Gynecology at University of Pittsburgh, Medical Department. 714 Jenkins Building, Pittsburgh, Pa.

1914.—Welton, Thurston Scott, M.D. Associate Visiting Gynecologist, Williamsburgh Hospital, Brooklyn; Residence and Office, 842 Union Street, Brooklyn, N. Y.

Founder.—Werder, Xavier Oswald, M.D., F.A.C.S. Professor of Gynecology at the University of Pittsburgh, Medical Department; Gynecologist to Mercy Hospital. *Treasurer*, 1888–1911. *President*, 1911. 714 Jenkins Building, Pittsburgh, Pa.

1904.—West, James Nephew, M.D., F.A.C.S. Professor of Diseases of Women and Secretary of the Faculty at the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1906. 71 West Forty-ninth Street, New York.

1896.—Westmoreland, Willis Foreman, M.D., F.A.C.S. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

1911.—White, George R., B.S., M.D., F.A.C.S. Surgeon Park View Sanitarium. 2 Liberty E., Savannah, Ga.

1916.—Wing, Lucius Arthur, B.Sc., M.D., Capt., M.C., U. S. Army, Attending Surgeon, Lying-In Hospital, City of New York; Assisting Surgeon, St. Mary's Free Hospital for Children; Instructor in Clinical Surgery, Cornell University Medical College. Office and Residence, 116 East Sixty-third St., New York, N. Y.

1909.—Yates, H. Wellington, M.D., F.A.C.S. Gynecologist to St. Mary's Hospital; Gynecologist to Providence Hospital; Assistant Professor of Gynecology, Detroit College of Medicine and Surgery; Member of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association; Member of the Staff of St. Luke's Hospital; Member of the Wayne County and Michigan State Medical Society; President Detroit Medical Club; Medical Director of the Peninsular Life Insurance Co. Residence, 1360 Fort Street, West; Office, 607 Gas Office Building, Detroit, Mich.

1907.—Ziegler, Charles Edward, A.M., M.D., F.A.C.S. Professor of Obstetrics in the University of Pittsburgh; Medical Direc-

tor of the Elizabeth Steele Magee Hospital for Women; Medical Director of the Pittsburgh Maternity Dispensary; Consulting Obstetrician to the Columbia Hospital and Consulting Obstetrician and Gynecologist to the Dixmont Hospital for the Insane. 406 Morewood Ave., Pittsburgh, Pa.

1900.—ZINKE, ERNST GUSTAV, M.D., F.A.C.S., Professor of Obstetrics and Clinical Midwifery in the Ohio-Miami Medical College, University of Cincinnati, 1896–1916. Emeritus Professor of Obstetrics, 1916. Consulting Obstetrician to Cincinnati General Hospital. Honorary Chief of Staff, and Obstetrician and Gynecologist to the Deaconess Hospital; President of the Cincinnati Obstetric Society, 1887; President Academy of Medicine of Cincinnati, 1894; Member and Chairman of Section on Obstetrics, Gynecology and Abdominal Surgery, American Medical Association, 1914; Honorary Member Jackson County Medical Society, Kansas City, Mo.; Honorary Member, Cincinnati Obstetric Society. *President*, 1908. *Executive Council*, 1909–1911. *Secretary*. 4 West Seventh St., Cincinnati, Ohio.

Total, one hundred and thirty-one Ordinary Fellows.

ORDINARY FELLOWS, DECEASED.

1902.—Abrams, Edward Thomas, A.M., M.D., F.A.C.S., Dollar Bay, Mich., 1918.

1890.—Asdale, William James, M.D., Beaver Falls, Pa., 1912.

Founder.—Baker, Washington Hopkins, M.D., Philadelphia, Pa., 1904.

1913.—Blume, Frederick, M.D., Pittsburgh, Pa., 1918.

1889.—Burns, Bernard, M.D., Allegheny, Pa., 1892.

1890.—Coles, Walter, M.D., St. Louis, Mo., 1892.

1889.—Davis, William Elias B., M.D., Birmingham, Ala., 1903.

1892.—Dorsett, Walter Blackburn, M.D., F.A.C.S., St. Louis, Mo., 1915.

1892.—Duff, John Milton, A.M., M.D., Ph.D., Pittsburgh, Pa., 1904.

1898.—Dunn, James C., M.D., Pittsburgh, Pa., 1907.

1892.—Dunning, Lehman Herbert, M.D., Indianapolis, Ind., 1906.

1895.—Ferguson, Alexander Hugh, M.D., Chicago, Ill., 1911.

1890.—Frederick, Carlton Cassius, B.S., M.D., Buffalo, N.Y., 1911.

1913.—Freeland, James Roy, M.D., F.A.C.S., Pittsburgh, Pa. 1917.

1891.—Gibbons, Henry, Jr., A.M., M.D., San Francisco, Cal., 1912.

1904.—Goodfellow, George E., M.D., Los Angeles, Cal., 1910.

1913.—Gray, Frank D., M.E.D., M.D. F.A.C.S., Jersey City, N.J., 1916.

1892.—Haggard, William David, Sr., M.D., Nashville, Tenn., 1901.

Founder.—Hill, Hampton Eugene, M.D., Saco, Me., 1894.

1912.—Hotaling, Albert Steuben, M.D., Syracuse, N. Y., 1913.

1898.—Hyde, Joel W., M.D., Brooklyn, N. Y., 1907.

1897.—Ingraham, Henry Downer, M.D., Buffalo, N. Y., 1904.

Founder.—Jarvis, George Cyprian, M.D., Hartford, Conn., 1900.

1892.—Jelks, James Thomas, M.D., Hot Springs, Ark., 1902.

1910.—Jenks, Nathan, B.S., M.D., F.A.C.S., Detroit, 1916.

1900.—Linville, Montgomery, A.B., M.D., New Castle, Pa., 1910.

Founder.—Lothrop, Thomas, M.D., Buffalo, N. Y., 1902.

1891.—McCann, James, M.D., Pittsburgh, Pa., 1893.

1898.—McCann, Thomas, M.D., Pittsburgh, Pa., 1903.

1896.—Mooney, Fletcher D., M.D., St. Louis, Mo., 1897.

1894.—Murphy, John Benjamin, A.M., M.D., F.A.C.S., Chicago, Ill., 1916.

Founder.—Potter, William Warren, M.D., Buffalo, N. Y., 1911.

Founder.—Price, Joseph, M.D., Philadelphia, Pa., 1911.

1896.—Rhett, Robert Barnwell, Jr., M.D., Charleston, S. C., 1901.

1889.—Rohe, George Henry, M.D., Baltimore, Md., 1899.

1892.—Rosenwasser, Marcus, M.D., Cleveland, O., 1910.

1890.—Ross, James Frederick Wm., M.D., C.M., L.R.C.P., Toronto, Ontario, Canada, 1911.

1889.—Seymour, William Wotkyns, A.B., M.D., Troy, N. Y., 1904.

1902.—Simons, Manning, M.D., Charleston, S. C., 1911.

1913.—Smith, Lewis W., A.B., M.D., Pittsburgh, Pa., 1917.

1913.—Stamm, Martin, M.D., F.A.C.S., Freemont, O., 1918.

Founder.—Townsend, Franklin, A.M., M.D., Albany, N. Y., 1895.

1907.—Vance, Ap Morgan, M.D., F.A.C.S., Louisville, Ky., 1915.

ORDINARY FELLOWS.

Classified.

ALABAMA.

Davis, John D. S.,	2031 Avenue G.,	Birmingham.
Morris, Lewis Coleman,	1203 Empire Bldg.,	Birmingham.
Torrance, Gaston,	325 Woodward Bldg.,	Birmingham.

ARKANSAS.

Runyan, Joseph Phineas,	State Bank Bldg.,	Little Rock.

CALIFORNIA.

Buteau, Samuel H.,	1155 Broadway,	Oakland.
Hadden, David,	Oakland Bank of Savings Bldg.,	Oakland.

CANADA.

Howitt, Henry,	221 Woolwich Street,	Guelph, Ontario.
Olmsted, Ingersoll,	215 South James St.,	Hamilton, Ontario.

GEORGIA.

Noble, George Henry,	186 South Pryor Street,	Atlanta.
Westmoreland, W. F.,	241 Equitable Bldg.,	Atlanta.
White, George R.,	2 Liberty E.,	Savannah.

ILLINOIS.

Bacon, Joseph Barnes,		Macomb.
Barrett, Channing,	561 Stratford Place,	Chicago.
Goldspohn, Albert,	34 Washington St.,	Chicago.
Percy, James F.,	147 S. Cherry St.,	Galesburg.

INDIANA.

Walker, Edwin,	712 South Fourth St.,	Evansville.
Porter, Miles F.,	207 West Wayne St.,	Fort Wayne.
Rosenthal, M. I.,	336 West Berry St.,	Fort Wayne.
Van Sweringen, Budd,	208 Washington Blvd.,	Fort Wayne.
Clark, Edmund D.,	712 Hume Mansur Bldg.,	Indianapolis.
Eastman, Thomas B.,	309 Pennway Bldg.,	Indianapolis.
Noble, Thomas B.,	720 Newton Claypool Bldg.,	Indianapolis.
Pantzer, Hugo O.,	224 North Meridian St.,	Indianapolis.
Pfaff, O. G.,	1337 North Pennsylvania St.,	Indianapolis.

IOWA.

Ruth, Charles E.,	407 Equitable Bldg.,	Des Moines.

KENTUCKY.

Frank, Louis,	The Atherton,	Louisville.

MAINE.

Leighton, Adam P.,	192 State St.,	Portland.

MARYLAND.

Branham, Joseph H.,	2200 Eutaw Place,	Baltimore.
Sellman, William A. B.,	5 East Biddle St.,	Baltimore.
Smith, William S.,	528 Hanover St.,	Baltimore.

MICHIGAN.

Bell, John Norval,	506 Washington Arcade,	Detroit.
Brown, Geo. Van Amber,	32 Adams Ave., West,	Detroit.
Carstens, J. Henry,	620 Woodward Ave.,	Detroit.
Davis, James E.,	821 West Fort St.,	Detroit.
Longyear, H. W.,	32 Adams Ave., W.	Detroit.
Manton, Walter P.,	32 Adams Ave., West,	Detroit.
Yates, H. Wellington,	1360 Fort Street,	Detroit.

MINNESOTA.

Litzenberg, Jennings C.,	Donaldson Bldg.,	Minneapolis.

MISSOURI.

Brown, John Young,	612 Metropolitan Bldg.,	Saint Louis.
Crossen, H. S.,	Metropolitan Bldg.,	Saint Louis.
Elbrecht, Oscar H.,	Metropolitan Bldg.,	Saint Louis.
Jonas, Ernst,	465 North Taylor Ave.,	Saint Louis.
Kirchner, Walter C. G.,	508 Metropolitan Bldg.,	Saint Louis.
Reder, Francis,	6346 Berlin Ave.,	Saint Louis.
Schwarz, Henry,	440 North Newstead Ave.,	Saint Louis.

NEBRASKA.

Findley, Palmer,	418 Brandeis Theater Bldg.,	Omaha.

NEW JERSEY.

Strasser, August A.,	115 Beech St.,	Arlington.
Darnall, Wm. Edgar,	1704 Pacific Ave.,	Atlantic City.
Marvel, Emery,	1801 Pacific Ave.,	Atlantic City.
Dickinson, Gordon K.,	280 Montgomery St.,	Jersey City.
Ill, Charles L.,	188 Clinton Ave.,	Newark.
Ill, Edward J.,	1002 Broad St.,	Newark.
Hedges, Ellis W.,	703 Watchung Ave.,	Plainfield.

NEW YORK.

Boyd, James P.,	152 Washington Ave.,	Albany.
Vander Veer, Albert,	28 Eagle Street,	Albany.
Vander Veer, Edgar A.,	150 State St.,	Albany.
Wade, Henry A.,	495 Greene Ave.,	Brooklyn.
Welton, T. Scott,	842 Union St.,	Brooklyn.
Congdon, Chas. E.,	859 Humboldt Parkway,	Buffalo.
Hayd, H. E.,	493 Delaware Ave.,	Buffalo.
King, James E.,	1248 Main St.,	Buffalo.
Lothrop, Earl P.,	153 Delaware Ave.,	Buffalo.
Potter, Irving W.,	420 Franklin St.,	Buffalo.
Chandler, George,	11 East Chestnut St.,	Kingston.
Peck, George A.,	189 Centre Ave.,	New Rochelle.
Bainbridge, W. S.,	34 Gramercy Place,	New York.
Bandler, S. W.,	134 West Eighty-seventh St.,	New York.
Davis, Asa B.,	42 East 35th St.,	New York.
Erdmann, John F.,	60 West Fifty-Second St.,	New York.
Furniss, Harry Dawson,	45 East 62d Street,	New York.
Harrar, James A.,	29 East Seventy-seventh St.,	New York.
Hill, I. L.,	616 Madison Ave.,	New York.
Lynch, Jerome Morley,	57 East 52nd St.,	New York.
McPherson, Ross A.,	45 West 62nd St.,	New York.
Meeker, Harold D.,	420 West End Ave.,	New York.
Morris, R. T.,	616 Madison Ave.,	New York.
Rongy, Abraham J.,	62 West 89th Street,	New York.
Stewart, Douglas H.,	128 West 86th St.,	New York.
Tovey, David W.,	240 Riverside Drive,	New York.
Waldo, Ralph,	54 West 71st St.,	New York.
West, James N.,	71 West Forty-ninth St.,	New York.
Wing, Lucius A.,	116 East Sixty-third St.,	New York.
Brown, Wm. M.	1776 East Ave.,	Rochester.
Moriarta, Douglas C.,	511 Broadway,	Saratoga Springs.
Sadlier, James E.,	295 Mill St.,	Poughkeepsie.
Poucher, John W.,	339 Mill St.,	Poughkeepsie.
Miller, A. B.,	326 Montgomery St.,	Syracuse.

NORTH CAROLINA.

Lott, Henry Stokes,	123 Cherry St.,	Winston.

OHIO.

Bonifield, Chas. L.,	409 Broadway,	Cincinnati.
Hall, Joseph A.,	628 Elm St.,	Cincinnati.
Hall, Rufus B.,	628 Elm St.,	Cincinnati
Miller, John D.,	N. E. Cor. Clifton & McMillan,	Cincinnati
Reed, C. A. L.,	The Groton,	Cincinnati.
Stark, Sigmar,	1108 East McMillan St.,	Cincinnati.
Tate, Magnus A.,	19 West Seventh St.,	Cincinnati.

Crile, George W.,	Osborn Bldg.,	Cleveland.
Humiston, William H.,	536 Rose Bldg.,	Cleveland.
Lincoln, Walter R.,	Lennox Bldg.,	Cleveland.
Scott, N. Stone,	603 Citizens Bldg.,	Cleveland.
Skeel, Arthur,	1834 East 65th St.,	Cleveland.
Skeel, Roland Edward,	314 Osborn Bldg.,	Cleveland.
Baldwin, James F.,	405 East Town St.,	Columbus.
Crotti, André,	51 East Broad St.,	Columbus.
Hamilton, Chas. S.,	142 South Garfield St.,	Columbus.
Stamm, Martin,	316 Napoleon St.,	Fremont.
Dice, Wm. Gordon,	240 Michigan St.,	Toledo.
Gillette, Wm. J.,	1613 Jefferson St.,	Toledo.
Jacobson, Julius H.,	2050 Franklin St.,	Toledo.
Moots, Chas. W.,	The Nicholas,	Toledo.
Smead, Lewis F.,	242 Michigan St.,	Toledo.
Smith, Chas. N.,	234 Michigan St.,	Toledo.
McClellan, Benjamin R.,	7 East Second St.,	Xenia.

PENNSYLVANIA.

Kennedy, James W.,	1409 Spruce St.,	Philadelphia.
Foster, Curtis S.,	308 Diamond Bank Bldg.	Pittsburgh.
Huggins, R. R.,	1018 Westinghouse Bldg.,	Pittsburgh.
Langfitt, William S.,	Jenkins Bldg.,	Pittsburgh.
Sanes, K. I.,	Jenkins Bldg.,	Pittsburgh.
Schildecker, Charles B.,	1105 Park Bldg.,	Pittsburgh.
Simpson, Frank F.,	Jenkins Bldg.,	Pittsburgh.
Stillwagen, Charles A.,	524 Pennsylvania Ave.,	Pittsburgh.
Swope, Lorenzo W.,	1105 Park Bldg.,	Pittsburgh.
Weiss, Edward A.,	714 Jenkins Bldg.,	Pittsburgh.
Werder, Xavier O.,	Jenkins Bldg.,	Pittsburgh.
Ziegler, Chas. E.,	406 Morewood Ave.,	Pittsburgh.

RHODE ISLAND.

Jones, Arthur T.,	81 Elm Grove Ave.,	Providence.
Keefe, John W.,	259 Benefit St.,	Providence.

TENNESSEE.

Haggard, William D.,	148 Eighth Ave., North,	Nashville.

VIRGINIA.

Baughman, Greer,	26 North Laurel St.,	Richmond.
Bosher, Lewis C.,	422 East Franklin St.,	Richmond.

MINUTES OF THE PROCEEDINGS

OF THE

THIRTY-FIRST ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT

STATLER HOTEL

DETROIT, MICH.

SEPTEMBER 16, 17, AND 18, 1918

THIRTY-FIRST ANNUAL MEETING.

September 16, 17 and 18, 1918.

The Fellows whose names appear below were present:

BAINBRIDGE, WILLIAM SEAMAN, New York City.
BELL, JOHN NORVAL, ... Detroit, Mich.
BILL, ARTHUR HOLBROOK, ... Cleveland, O.
BONIFIELD, CHARLES LYBRAND, Cincinnati, O.
BROWN, GEORGE VAN AMBER, . . Detroit, Mich.
BROWN, WILLIAM MORTIMER, . . Rochester, N. Y.
BURCKHARDT, LOUIS,. . . . . Indianapolis, Ind.
CARSTENS, J. HENRY, ... Detroit, Mich.
DAVIS, JAMES ETHELBERT, ... Detroit, Mich.
DICE, WILLIAM G . . . . . Toledo, O.
DICKINSON, GORDON K., ... Jersey City, N. J.
ERDMANN, JOHN FREDERICK, . . New York City.
GILLETTE, WILLIAM J., ... Toledo, O.
GOLDSPOHN, ALBERT, ... Chicago, Ill.
HAYD, HERMAN EMIL, ... Buffalo, N. Y.
ILL, EDWARD JOSEPH, ... Newark, N. J.
JACOBSON, JULIUS H., ... Toledo, O.
JONES, ARTHUR THOMS, ... Providence, R. I.
KEEFE, JOHN WILLIAM, ... Providence, R. I.
LITZENBERG, JENNINGS, ... Minneapolis, Minn.
MILLER, AARON BENJAMIN, . . . Syracuse, N. Y.
MILLER, JOHN D., ... Cincinnati, O.
MORRIS, ROBERT TUTTLE, ... New York City.
MOSHER, GEORGE CLARK, ... Kansas City, Mo.
NOBLE, THOMAS BENJAMIN, . . . Indianapolis, Ind.
PANTZER, HUGO OTTO, ... Indianapolis, Ind.
POTTER, IRVING WHITE, ... Buffalo, N. Y.
REDER, FRANCIS, ... St. Louis, Mo.
RONGY, ABRAHAM JACOB, ... New York City.
RUNYAN, JOSEPH PHINEAS, . . . Little Rock, Ark.
SADLIER, JAMES EDGAR, ... Poughkeepsie, N. Y.

SANES, K. ISADORE, ... Pittsburgh, Pa.
SKEEL, ARTHUR JULIUS, ... Cleveland, O.
TATE, MAGNUS ALFRED, ... Cincinnati, O.
VANDER VEER, EDGAR ALBERT, . Albany, N. Y.
WEISS, EDWARD ALOYSIUS, ... Pittsburgh, Pa.
YATES, H. WELLINGTON, ... Detroit, Mich.
ZINKE, ERNST GUSTAV, ... Cincinnati, O.
Total 38.

The following-named guests were extended the privileges of the floor and invited to participate in the discussions:

Baker, George J., ... Detroit, Mich.
Bun, G. C., ... Detroit, Mich.
Chamberlain, G. L., ... Detroit, Mich.
Cowan, Angus L., ... Detroit, Mich.
Donnelly, Leo C., ... Detroit, Mich.
Hagerty, Hugh A., ... Detroit, Mich.
Hewitt, Herbert W., ... Detroit, Mich.
Hodge, James B., ... Detroit, Mich.
Judd, C. Hollister, ... Detroit, Mich.
Lipsky, Jacob S., ... Detroit, Mich.
Livingston, George M., ... Detroit Mich.
McAlister, G., ... Highland Park, Mich.
McClurg, David, ... Highland Park, Mich.
Millhoff, W. C. D., ... Detroit, Mich.
Murray, Luther A., ... Detroit, Mich.
Patten, T. J., Lt. Com., U. S. N., . . Detroit, Mich.
Perkins, Ralph A., Asst. Surgeon, N. S. N., Detroit, Mich.
Poston, Harry P., ... Detroit, Mich.
Spurney, Albert F., ... Cleveland, O.
Van Hoosen, Bertha, ... Chicago, Ill.
Wallace, Walter B., ... Detroit, Mich.
Welz, Walter E., ... Detroit, Mich.
Windsor, Arthur, ... Windsor, Ontario, Can.
Total, 23.

First Day—*Monday, September* 16, 1918.

Morning Session.—The Association met at 9.30 A. M. at the Statler Hotel, and was called to order by the President, Dr. Albert Goldspohn, Chicago, Illinois, who introduced the Hon. Oscar B. Marx, Mayor of Detroit, who delivered the following

ADDRESS OF WELCOME.

Mr. President and Fellows of the American Association of Obstetricians and Gynecologists: It is indeed a pleasure for me to have this opportunity to extend to you a welcome to our city. We are glad that you are having your thirty-first annual meeting here, because we are proud of our city, and I dare say from some remarks I just heard that Detroit is well represented with seven men in your association, but I can assure you that there are others in this city who are equally competent. However, that is a matter for you to decide.

There is no question but that this meeting of yours is a very important one, especially in these times. We appreciate the many problems that you have listed for discussion and we hope that every one of them will be solved in a correct manner. Your discussions will undoubtedly be most interesting, and all I can say to you is that I hope when you finish, every one will go away satisfied that the work you have accomplished has been well done.

It is needless for me to say to you who have come to Detroit from all parts of this country, that we have many places for you to visit if you find the time, especially at present when this wonderful war work is going on in our city. If you have the opportunity and inclination, I would advise you to visit a few of our institutions, because they will open your eyes to see what a city can do in an emergency. You have done more during the last few years than it was thought possible to accomplish, and a similiar progress is to be observed in the factory world.

I appreciate your coming here, and I want to thank you for selecting Detroit as your meeting place. I trust you will like the city so well that you will soon return. I thank you. (Applause.)

The President.—We shall now listen to an address of welcome by Dr. Bell, President of the Wayne County Medical Society.

ADDRESS OF WELCOME BY DR. JOHN NORVAL BELL.

Mr. President and Fellows of the Association: It hardly seems necessary to extend to you a welcome to Detroit. You men who know us so well and have visited us so often, do not really need a welcome, but it affords me very great pleasure, nevertheless, to greet you on the occasion of this meeting in Detroit.

The relationship which exists between the medical profession of Detroit and this association seems to be like that which exists between a man and his wife. A man loves his wife very dearly, and she

knows he loves her, but the dear little woman is not quite happy until he puts his arms around her and tells her of his love. So I feel it is for me on this occasion to put my arms around you and tell you that we love you, and that we are glad to have you with us.

The doctors of Detroit are a unit. Factionalism has ceased to exist in our city. Of this we are proud, and this happy condition we attribute largely to the establishment of a medical club at 33 High Street, East. We want you to visit our home. At this club it is the habit of a great many of the doctors who have hospital work and hospital affiliations to meet at the noon hour, have light refreshments, read papers, discuss the topics of the day, and forget our troubles. To our beautiful city and to this united body of good fellows of the medical profession, it affords me a great deal of pleasure to extend to you a hearty welcome.

There is one other work of progress to which I want to call attention. Our mayor did not tell you how rapidly and wonderfully our city has developed and is developing. In a recent number of the Journal of the American Medical Association a list of the medical colleges in the United States was printed, the Detroit College of Medicine was mentioned as being located in a city with a population of 525,000. I want to tell you that the population of Detroit has increased until it now numbers almost 900,000.

We are to have a luncheon at our medical home at noon, and the latchstring is always out there at any hour of the day or night to you. (Applause.)

The President.—To these cordial addresses of welcome a response will be made by our Vice-Presidents, Dr. William Seaman Bainbridge and Dr. Arthur T. Jones. I will call upon Dr. Bainbridge to respond to these addresses of welcome.

RESPONSE BY DR. WILLIAM SEAMAN BAINBRIDGE.

Your Honor, the Mayor, Mr. President, and Mr. President of the Wayne County Medical Society: Through the courtesy of the Surgeon-General of the Navy, I am allowed to come to this meeting. I think it is due him that I make that statement.

Mr. Mayor, we thank you and Dr. Bell for your cordial greetings and welcome. We recall with great pleasure our previous meeting in Detroit. Several distinguished members of our association live in this city, and among them are that stalwart Corinthian column, Dr. Carstens, and others. There is here not only harmony of the professional type, but also the spiritual side of harmony in this great organization of the profession of medicine.

The other day, at the Charing Cross Station in London, when men from the uttermost ends of the earth were hurrying to and fro, there were many expressions of "Good bye, so long, Tommy; see you next year or perhaps never." It was remarkable to see the demonstration of the spirit of the soldiers as they passed through the station. Among other things I saw this sign: "No man, woman or child living to-day has a right to use the time, the energy, or the money of any other person except for one single purpose in the world, namely, for a permanent liberty based on an absolute victory." (Applause.) So, sir, perhaps in my humble capacity as an officer in the service, just returned from over there, I can answer that question from the battlefield. If we cannot answer it, we ought not to be here meeting to-day. There are wonderful duties to be performed. I believe we have our answer in the battlefield. There are many in need of help that doctors and nurses and aids cannot care for. Many a wounded man that is about to be given medical attention says to the doctor or nurse, "Take care of him first; I can get along." This spirit of unselfishness and self-denial is prevalent among the boys. There is no question about our men in the service. You hear them say, "We are all right; we can get along; I hope they are all right at home." The Red Cross takes care of the people at home who may be in trouble, and the thought expressed in words on the other side soon finds expression on this side, so that families are looked up and given relief. The boys over there, the men behind the guns, need your encouragement and your help. You who are members of this association meet in times of peace to compare notes and to determine the best way to take lessons and put them into action. From your own efforts you are discovering how to care more effectively for the people in civilian life, and I believe that our meeting in Detroit will definitely accrue to the benefit of the men at the front because important lessons being learned here, facts are accumulating, and the result will be the better care of the people at home. And so, it seems to me, we are here for an important purpose, and we accept your splendid hospitality. Remember, the man without a uniform is doing just as much work as the man in Khaki. It is simply a question of not doing his bit, but his best, in the place where he is called to serve the one purpose of aiding the armies and navies that are fighting from the front trench to the last line; and in this way every man and woman is fighting to win this great war. (Loud applause.)

The President.—Our Vice-president, Dr. Arthur T. Jones, will likewise respond to the addresses of welcome.

RESPONSE BY DR. ARTHUR T. JONES.

Mr. President and Fellows of the Association: I feel there is very little for me to say in following Dr. Bainbridge, but I wish to add my bit in expressing the thanks of our association to the fellows of the Wayne County Medical Society and to our local committee of Detroit for this very cordial welcome that you have given to us at this time.

It was some fifteen years ago, I believe, that our association met here. At that time, I did not have the pleasure of enjoying your hospitality; but your city has grown and developed wonderfully since then. I understand your population has increased some three hundred per cent., but it is quite evident that there is one thing which could not possibly increase, and that is your good fellowship and your hospitality. We thank you for this cordial welcome, for the program which you have laid out for the entertainment of the ladies and the Fellows; and I am sure that this gathering in Detroit will rank with our previous meetings in its character, in its quality, and in its enjoyment. I thank you. (Applause.)

Papers were then read as follows:

1. "The benefits of stab-wound drainage in pelvic infection," by Dr. H. Wellington Yates, Detroit, Michigan.

Discussed by Drs. Dickinson, Carstens, Wm. M. Brown, Keefe, Bonifield, Pantzer, and in closing by the essayist.

2. "Gunshot wound of the abdomen," by Dr. Charles L. Bonifield, Cincinnati, Ohio, which was discussed by Drs. Noble and Erdmann, and in conclusion by the essayist.

3. "Does surgery ever cure cancer," by Dr. Magnus A. Tate, Cincinnati, Ohio.

Discussed by Drs. Bainbridge, Edw. J. Ill, VanHoosen, Pantzer, Carstens, and G. V. A. Brown.

4. "Differential diagnosis in diseases of the gall-bladder and ulcer of the duodenum," by Dr. John F. Erdmann, New York City, which was discussed by Drs. Hayd and Pantzer.

On motion of Dr. Bonifield, the association took a recess until 2.30 P. M.

Afternoon Session.—The Association reconvened at 2.30 P. M. and was called to order by the President.

5. "Acute dilatation of the stomach," by Dr. William J. Gillette, Toledo, Ohio, which was discussed by Drs. Dickinson, Pantzer, Bonifield, Runyan, and in conclusion by the essayist.

6. "Sarcoma of the right ovary in a child twenty-three months old," by Dr. Herman E. Hayd, Buffalo, New York.

Discussed by Drs. Edw. J. Ill, T. B. Noble, Dickinson, VanHoosen, Carstens, Goldspohn, and in closing by the essayist.

7. "Ligation of inferior vena cava," by Dr. Thomas B. Noble, Indianapolis, Indiana, which was discussed by Drs. Wm. M. Brown, Dickinson, Bainbridge, J. E. Davis, Edw. J. Ill, Bonifield, and in closing by the essayist.

The acting secretary *pro tem* (Dr. Hayd) read letters and telegrams from Dr. Ross McPherson, Dr. Ira L. Hill, and Dr. George W. Kosmak, regretting their inability to attend the meeting.

8. "Ileocecal stasis; its causes and treatment," by Dr. Hugo O. Pantzer, Indianapolis, Indiana.

Discussed by Dr. Bainbridge, and in closing by the essayist.

9. "The rôle of congenital colonic membranes in the causation of disease," by Dr. Joseph P. Runyan, Little Rock, Arkansas.

Discussed by Drs. Bainbridge, Davis, Dickinson, Pantzer, Bainbridge, and in closing by the essayist.

10. "Report of a case of pancreatic cyst in association with tubercular kidney and intestinal complications," by Dr. James E. Sadlier, Poughkeepsie, New York, which was discussed by Drs. Wm. M. Brown, Goldspohn, and Pantzer.

On motion, the association took a recess until 7.30 P. M.

Evening Session.—The Association reconvened at 7.30 P. M. and was called to order by the President.

11. "Motion picture demonstration of the Werder operation for cancer of the cervix," by Dr. Edward A. Weiss, Pittsburgh, Pennsylvania.

Discussed by Drs. Jones, G. V. A. Brown, Keefe, Bainbridge, VanHoosen, Carstens, and discussion closed by Dr. Weiss.

A paper by Dr. David Hadden, Oakland, California.

12. "Some unusual abdominal cases," by Dr. Edgar A. Vander Veer, Albany, New York, which was discussed by Drs. Erdmann and Keefe.

13. "The heart of a pregnant woman," by Dr. Louis Burckhardt, Indianapolis, Indiana.

Discussed by Drs. Wm. M. Brown, A. J. Skeel, Pantzer, J. E. Davis, and in closing by the essayist.

14. "Forceps rotation of the head in persistent occipitoposterior position," by Dr. Arthur H. Bill, Cleveland, Ohio, which was discussed by Drs. Wm. M. Brown, Bell, Burckhardt, Tate, Potter, Litzenberg, A. J. Skeel, and in closing by the author of the paper.

15. "The literature, biographical and otherwise, of ectopic gestation," by Dr. Gordon K. Dickinson, Jersey City, New Jersey, which was discussed by Drs. Bainbridge and Pantzer.

On motion, the association adjourned until 9.00 A. M., September 17.

SECOND DAY—*September* 17, 1918.

Morning Session.—The Association met at 9.00 A. M. and was called to order by the President.

16. "A study of various cases of pregnancy toxemia," by Dr. George C. Mosher, Kansas City, Missouri, which was discussed by Drs. Wm. M. Brown, Hayd, Rongy, Litzenberg, Pantzer, A. J. Skeel, Tate, Burckhardt, Judd, and in closing by the essayist.

17. "Pathologic conditions of the pelvic viscera, the result of induced abortions causing sterilization, disclosed by abdominal section," by Dr. Francis Reder, St. Louis, Missouri.

Discussed by Drs. A. J. Skeel, Carstens, T. B. Noble, J. E. Davis, and in closing by the author of the paper.

18. "The Irving W. Potter method of practising obstetrics," by Dr. E. Gustav Zinke, Cincinnati, Ohio, which was discussed by Drs. Pantzer, Hayd, Dickinson, Carstens, Bill, Wm. M. Brown, Judd, Rongy, and Potter; the discussion was closed by the author of the paper.

19. "President's Address," by Dr. Albert Goldspohn, Chicago, Illinois.

On motion, the association took a recess until 2.00 P. M.

Afternoon Session.—The Association reconvened at 2.00 P. M. and was called to order by the Vice-president, Dr. William Seaman Bainbridge.

20. "Cesarean section under local anesthesia; case reports," by Dr. William Mortimer Brown, Rochester, New York.

21. "Cesarean section," by Dr. Abraham J. Rongy, New York City.

These two papers were discussed together by Drs. Bill, A. J. Skeel, Edw. J. Ill, and in closing by the essayists.

22. "Do not sterilize women when operating for tubercular peritonitis," by Dr. J. Henry Carstens, Detroit, Michigan.

Discussed by Drs. Hayd, Bonifield, T. B. Noble, Morris, G. V. A. Brown, Dickinson, J. E. Davis, and in closing by the essayist.

The Secretary read a telegram from Dr. Albert Vander Veer, Albany, New York, regretting his inability to attend the meeting and expressing his best wishes for a successful session.

23. "Recognition and management of labor injuries," by Dr. Arthur J. Skeel, Cleveland, Ohio.

Discussed by Drs. Reder, Morris, Yates, VanHoosen, and in closing by the essayist.

24. "The verdict of menopause," by Dr. K. Isadore Sanes, Pittsburgh, Pennsylvania. (No discussion.)

25. "Intestinal actinomycosis," by Dr. John W. Keefe, Providence, Rhode Island.

Discussed by Dr. Bainbridge.

On motion, the association adjourned until 9.00 A. M. Wednesday, September 18th.

THIRD DAY—*September* 18, 1918.

Morning Session.—The Association met at 9.30 A. M. and was called to order by the President.

26. "Problems in ureteral surgery in gynecology," by Dr. G. Van Amber Brown, Detroit, Michigan, which was discussed by Drs. A. B. Miller, Morris, Sanes, Jacobson, Reder, after which the discussion was closed by the essayist.

27. "Accidental removal of intestines through the vaginal vault," by Dr. Edward J. Ill, Newark, New Jersey.

Discussed by Drs. G. V. A. Brown, Hayd, Morris, Sanes, Edw. J. Ill, Dickinson, and Bainbridge, and in closing by the author of the paper.

28. "Recurrence of symptoms after gall-bladder operations," by Dr. Julius H. Jacobson, Toledo, Ohio.

Discussed by Drs. Pantzer, Dickinson, Carstens, Zinke, and in closing by the essayist.

29. "Operations for stigmata of decline," by Dr. Robert T. Morris, New York.

Discussed by Drs. Carstens, Pantzer, Davis, Goldspohn, and in closing by the essayist.

30. "Success after fifty," by Dr. G. Van Amber Brown, Detroit, Michigan.

Discussed by Drs. Dickinson, Carstens, Zinke, and in closing by the essayist.

31. "Clinical, pathological, and sociological observations upon eighty interned venereal patients," by Dr. James E. Davis, Detroit, Michigan.

Discussed by Drs. Bainbridge, Carstens, Keefe, Sadlier, and in closing by the essayist.

The following papers were read by title:

1. "A case of interstitial tubal pregnancy rupturing into the abdominal cavity," by Dr. Orange G. Pfaff, Indianapolis, Indiana.

2. "Report of a case of gall-bladder soap with presentation of specimen," by Dr. Douglas H. Stewart, New York City.

3. "Some of the difficulties, failures and opportunities of war surgery," by Dr. R. E. Skeel, Cleveland, Ohio.

4. "Ruptured appendix; recurrent cyst of parovarium; intestinal obstruction following the Gilliam operation; three tubal conceptions in one woman; two cases illustrating rapidity of tubal regeneration," by Dr. David Hadden, Oakland, California.

5. "Painless childbirth and the safe conduct of labor," by Dr. Henry Schwarz, St. Louis, Mo.

6. "Report of a case of ablatio placentæ," by Dr. Lewis F. Smead, Toledo, Ohio.

Dr. A. B. Miller.—I should like you to substitute the name of Dr. Dickinson, Jersey City, who has been in conference over this matter, and his heart and sympathies are with this movement. He is located more centrally than I am, and I should like to have you appoint Dr. Dickinson in my stead.

It was agreed to appoint Dr. Dickinson on the committee in place of Dr. Miller.

The motion was then put and carried.

The Secretary.—The "In Memoriams" are to be read by title.

The Secretary.—I move that the thanks of the Association be extended to the Committee on Arrangements for having discharged their duties so well. I would also move that the hotel authorities be thanked for the manner in which they have furnished us accommodations for this meeting.

Motion seconded by Dr. Keefe and carried.

The Secretary.—In the absence of the majority of those elected to office, I would suggest that some one move that the ceremonies of induction of officers be dispensed with, and that we adjourn to meet again next year.

Dr. Pantzer.—I so move.

Seconded and carried.

Dr. A. B. Miller.—I move that we now adjourn *sine die*.

Seconded and carried.

E. Gustav Zinke, M. D., *Secretary*.

Executive Sessions.

Monday, September 16, 1918.

The President, Dr. Albert Goldspohn, in the chair.

The President.—The first item of business is the report of the Secretary. I am very sorry Dr. Zinke is ill this morning and is unable to be with us. Dr. Hayd will act as Secretary *pro tem.*

Dr. Hayd.—At our executive meeting last evening, the Executive Committee recommended for membership Dr. Otto H. Schwarz, St. Louis, Missouri, and Dr. George Charles Mosher, Kansas City, Missouri.

Th Preesident.—What will you do with these applications for membership which have been recommended by the Executive Council?

Dr. Arthur T. Jones.—I move that they be elected members of the Association.

Seconded and carried.

Dr. Hayd.—Dr. Zinke has received a number of telegrams and letters from members regretting their inability to be with us, and would have read these if he were present.

The President.—The next matter of business is the reports of the Secretary and Treasurer.

Dr. Hayd.—As Treasurer, I am pleased to report that we have in the treasury of the association $1436.63, with all bills paid, except for the programs, and a couple of initiation fees, which will be returned as the committee last night did not act favorably on the applications of some of the candidates, so that we have approximately $1350 in the treasury.

The President.—I will appoint on the Auditing Committee those gentlemen who have usually attended to this business, and who are well qualified to do it, namely, Drs. Bonifield, Pantzer, and Edw. J. Ill.

Adjourned.

Monday, September 16, 1918.

The President in the Chair.

Dr. C. L. Bonifield.—The members of the Auditing Committee have carefully examined the books and accounts of the Secretary and Treasurer and find them correct. The books show that the association has a balance in the treasury of $1436.63.

The President.—What will you do with the report of the Auditing Committee?

Dr. John D. Miller.—I move that the report be accepted and filed.

Seconded and carried.

Dr. Edward J. Ill.—I should like to ask the treasurer what he thinks about investing $1000 of the funds of the association in Liberty Bonds of the next issue?

Dr. Hayd.—I think it would be a splendid idea.

Dr. Ill.—I move that we invest $1000 in Liberty Bonds of the next issue.

Seconded and carried unanimously.

Adjourned.

Tuesday, September 17, 1918.

The President in the Chair.

The President.—The first matter of business in order is the nominations for the various offices. Nominations are now in order for President.

Dr. Edward J. Ill.—I am one of the founders of this association, and during all the years of my attendance upon these meetings I have never had occasion to make a speech nominating a candidate for president, but I want to do it to-day, however, and hope the association will see fit to accept my suggestion. It is with great pleasure that I nominate Dr. John F. Erdmann of New York City, for president. (Applause.)

Dr. Charles L. Bonifield.—I intended to have that honor myself, but Dr. Ill has taken it upon himself. However, I take great pleasure in seconding the nomination of Dr. Erdmann who is very active and will bring to this office the same energies and activities he has shown in the city of New York. The association will honor itself by honoring him, and I hope he will be unanimously elected.

Dr. A. B. Miller.—I move that nominations for president be closed; and that the secretary be instructed to cast the ballot of the Association for Dr. Erdmann as president.

Seconded and carried.

The ballot was cast as instructed, and Dr. Erdmann was declared duly elected.

Dr. Arthur T. Jones nominated Dr. Edward A. Weiss, of Pittsburgh, for first vice-president, a nomination which was seconded by Dr. Dickinson.

Dr. Bainbridge moved that nominations for this office be closed.

Seconded and carried.

Dr. Keefe moved that the secretary be instructed to cast the ballot for Dr. Weiss as first vice-president.

Seconded by Dr. Bonifield and carried.

The secretary cast the ballot for Dr. Weiss as instructed and he was declared duly elected.

Dr. Sadlier nominated Dr. H. Wellington Yates of Detroit, for second vice-president, a nomination which was seconded by Dr. Bonifield.

Dr. Bonifield then moved that the secretary cast the unanimous ballot of the association for Dr. Yates as second vice-president.

Seconded and carried.

The secretary cast the ballot as instructed and Dr. Yates was declared duly elected.

Dr. Hayd nominated Dr. E. Gustav Zinke for secretary to succeed himself.

Dr. Bainbridge moved that nominations be closed, and that the treasurer (Dr. Hayd) be empowered in behalf of the association to cast the unanimous ballot for Dr. Zinke as secretary.

Seconded by Dr. Bonifield and carried.

Dr. Hayd cast the ballot for Dr. Zinke as instructed and he was declared unanimously elected.

Dr. Arthur T. Jones nominated Dr. Herman E. Hayd to succeed himself as treasurer, a nomination which was seconded by Dr. Morris and Dr. Sanes.

Dr. Bonifield moved that the secretary cast the ballot unanimously for Dr. Hayd as treasurer.

Seconded and carried.

The secretary cast the ballot for Dr. Hayd as instructed and he was declared duly elected.

Dr. Bainbridge nominated Dr. Charles L. Bonifield to fill the one vacancy on the Executive Council, a nomination which was seconded by Dr. Sanes.

Dr. Bainbridge moved that the secretary cast the unanimous ballot for Dr. Bonifield as member of the council.

Seconded and carried.

The secretary cast the ballot for Dr. Bonifield as instructed and he was declared duly elected.

Dr. Bonifield extended an invitation to the association to hold its next meeting in Cincinnati. The invitation was seconded by Dr. Magnus A. Tate.

Dr. Gordon K. Dickinson.—I move that the invitation to meet in Cincinnati next year be accepted.

Seconded and carried.

On motion of Dr. Hayd, the Executive Session then adjourned *sine die*.

E. Gustav Zinke, M. D., *Secretary*.

PAPERS

READ AT THE

THIRTY-FIRST ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT

STATLER HOTEL

DETROIT, MICH.

SEPTEMBER 16, 17, AND 18, 1918

ADDRESS OF THE PRESIDENT.

ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

BY

ALBERT GOLDSPOHN, M. S., M. D.,

Chicago, Ill.

Esteemed Fellows:

We have met again at this annual event for mutual exchange of our experiences, discoveries, and achievements in truly altruistic manner. We come to this, one of the highest and most virile national scientific tribunals, for a final judgment upon our productions and achievements; so that that which is real, important, and practical may be divested of that which is imaginary, overestimated, or visionary; so that the pure gold of truth may be gathered from the dross, in the fire of kindly but fearless discussion.

To preside at a scientific congress where rules and methods of procedure, akin to laws, are to be established to govern practitioners in our specialty, and to conduct a meeting where measures are determined that profoundly affect the health and life of a large part of the confiding public; these are privileges which are inclined to make one feel his littleness as well as to appreciate the honor bestowed by his fellows. Therefore I wish to assure you, gentlemen, that I most highly esteem your kindness to me, in the honor conferred, and that I am grateful to all who contribute to our program. But nobler far than any of our deeds, and entitled to greater consideration, are those of our Fellows who are not with us this year, because they are engaged on that higher plane of duty, sacrifice, hardships, and danger to which they have been drawn by patriotism toward our country in its present struggle. My suggestion would be, therefore, that their names be gathered, in due time, in a list to be inserted in our transactions as a roll of honor.

As a theme for this occasion my natural preference would have been to dwell on the altruism and noble traits which, in the main, characterize our profession; but defects and wrongs also exist among us. Furthermore, while commemoration of the great and numerous gifts to our science by illustrious predecessors and contemporaries is always appropriate and inspiring, and while laudatory

reviews of our collective attainments are normal and pleasing, nevertheless, this type of address has abounded in the past. It seems to me, therefore, that pointing out some of our defects, errors, and conditions that work wrongs to both the profession and the public may be more useful, although less sublime and pleasing, than a contemplation of our virtues would be.

Permit me to invite your attention to some thoughts and suggestions, *first*, on the subject of *standardization of specialists in surgery and its various branches, including obstetrics*. A better conception of the difference between a general practitioner and a specialist is needed by the general public. They should understand that the former, with his doctor's and hospital diploma and State permit to practice, is one who knows some parts of all the different branches in medicine and surgery, but does not know all about any one of them; while the latter is one who began with this preliminary knowledge as merely a foundation, to which he has added the relatively complete knowledge and special skill required in some one of the specialties, by a second medical course of particular study and training, such as will be suggested later.

The instances are too numerous in which a mere student, who has no knowledge of what branch of medicine he will be most efficient in, chooses a specialty which, to his childish vision, appears least irksome or most lucrative, and then aims for that by the shortest route, without obtaining the necessary basis of a sufficiently general and practical knowledge of every branch of medicine and surgery. The field of vision of such specialists, even if they are well informed in their own branch of the profession, is so narrow that they will attempt to treat too many diverse and general disorders in their special way, when these would be much more successfully handled by a good general practitioner. For instance, we note the published and more numerous unpublished cases of stomach operations in cases with tabetic crises, or with referred functional disorders due to diseases in other parts of the body; operations for floating kidney in cases where this is not pathological, or where it is but a part of a general viseroptosis that causes the symptoms; removal of the vermiform appendix in cases with a painful tube or ovary which are often amenable to nonoperative treatment, or mistakenly for ureteral calculus, or for various indefinite assumptions of disease; operations on the cervix uteri for blemishes that do not affect the health of the patient; removal of the coccyx for pain which is due mostly to varicose conditions about the sacral nerves, together with other pelvic or spinal disorders; the prescribing of

glasses for headaches that are due to defective alimentation or metabolism, etc. Furthermore, the instances are numerous where mere and meager general practitioners with feeble consciences venture to perform the serious major duties of a specialist, even though they have had little or no special training. The writer has repeatedly observed cases similar to the following. A well-to-do student attending a reputable medical college aimed at a specialty before he graduated. With the exception of a year spent in an eye and ear infirmary, he had never served as an assistant or as an interne. He then began practice as a specialist in diseases of the eye, ear, nose and throat; and all ability that he now has in the treatment of the ear, nose and throat, through which he chiefly prospers, he has not developed normally by the expenditure of his own time, means, and effort as an assistant to a master and by special studies, but has gained it at the expense of his patients' means, health, and lives; for the numerous instances in which mere tonsilectomies, in his hands, were attended by extreme hemorrhage that was fatal in at least one case and nearly so in many others, have been appalling. Nevertheless, these atrocities continued for several years. Another example: A like tyro, without even an ordinary knowledge of pathology and with little diagnostic ability assisted me for a short time, until I learned that he was obtaining major cases for himself on grossly false pretenses, and then expected me in consultation to uphold him in erroneously proposed operations and to shield him from just condemnation for the evil results of some of his operations. He received several warm exhortations and was then promptly dropped from recognition; but he would also have been exposed as an imposter, if such cases were better provided for by our code of ethics. Again, in numerous instances fair internists or general practitioners who have gained the confidence and esteem of patients by successful treatment of purely medical disorders, will betray this confidence by asking or consenting to do major surgical operations for them, for which they have no fitness or training. The writer has consulted a goodly number of eminent senior men in various specialties on this subject, verbally and by letter. Some say in words and others in substance that there are criminals in the medical profession whose crimes are of this nature. They all affirm that these evil conditions exist among us, and that, as prevention is easier and better than a cure, standardization of specialists in medicine is greatly needed.

Dr. William J. Mayo says: "The evils in our present methods of developing specialties which you point out in your letter are well

known to us all and are daily in evidence. The remedies that you propose are practical and within the reach of every deserving young man. Doctor Charles Mayo and I endorse your position fully."

Dr. Edward E. Montgomery, after affirming the necessity of a good general practitioner's training as a foundation for a specialty, says: "These errors are not confined to any one kind of specialist, but are common to the internal man as well as the operator. Indeed, I think that the internal medical man has learned much at the operating table. Thus I have seen cases treated for typhoid due to the presence of pus in the pelvis; sciatica cured by the removal of an imprisoned fibroid or an ovarian cyst; the appendix removed when the condition was located in the uterine appendages; the diagnosis of renal and ureteral calculi when the appendix was guilty; various operations on the upper abdomen when the symptoms were the result of displacements of the uterus, backward particularly, and enlargements of the pelvic organs from fibroids and ovarian growths. Cholecystitis, ulcer of the stomach and duodenum, visceroptosis, and acute and chronic pancreatitis are all conditions which afford opportunities for error with the unwary and uneducated."

Dr. Charles G. Stockton, of Buffalo, N. Y., says: "Of course I have seen numerous instances of poor work by ignorant and inexperienced so-called specialists. I think the trouble is increasing rather than otherwise. To some extent this is a result of the taking of short courses at post-graduate schools. These courses are good enough as far as they go; but these alone are not what is required to make a specialist out of a poorly trained general practitioner."

Dr. Arthur Dean Bevan, in addressing the surgical sections of the American Medical Association in 1917, after saying that most of the surgeons in our country are competent and that their work is good, declared: "On the other hand, those who are in touch actively with surgical therapy, who see a large number of surgical cases, and who come into contact with a large number of men doing surgical operations, can but be impressed by the fact that there is a certain considerable number of operations being performed in this country that are unnecessary and unwarranted, and there is a considerable number of men operating who are not qualified to do the work." Again, he says: "What shall be done about the unnecessary operations done by dishonest men for a fee; the unnecessary appendix operations done for imaginary appendicitis; the unnecessary fixations of the kidney; the unnecessary amputations of the breast done for benign or imaginary breast tumors; the unnecessary operations on the female genitals, on tonsils, on gall-bladder, etc.? What shall be

done about the operations that are due to lack of good judgment and misguided enthusiasm; the unnecessary operations on fractures; the fantastic operations for intestinal stasis without gross pathology; operations for supposed inefficiency of the ileocecal valve based on misinterpreted Röntgen evidence; intestinal anastomosis or resections of large intestine for the cure of epilepsy? These are problems which we should meet frankly, investigate fully, and find means to correct; and this should be done by some properly qualified instrument of the American Medical Association." Our worthy fellow, Doctor Aaron Benjamin Miller, in his presidential address before this body in 1910, speaks briefly of the menace of permitting incompetent men to perform operations, and operations that are often unnecessary or improper; and he asks whether a license or diploma should not be possessed by qualified surgeons. In 1909 our esteemed fellow, Doctor J. Henry Carstens, in a paper before this body, clearly set forth that the venturesome student or general practitioner of this generation has no excuse for wanting to develop into a specialist at the expense of his patients by practising upon them and that the needed theoretical and practical knowledge and methods of procedure have been accessibly recorded by men of earlier generations who blazed the way.

Dr. Albert J. Ochsner, chairman of the committee on credentials of the American College of Surgeons, says: "Regarding the abuses to which patients are exposed because of the lack of standardization of specialists, one could write volumes. Less than half a century ago the young medical man who desired to become a specialist had very few, if any, opportunities to obtain the necessary training outside of continental Europe, hence many of the very best men were forced to obtain their skill after an improvised plan for each individual case; but what then was a necessity for men of extraordinary intellect, industry, intuition, perseverance, and endurance, together with a willingness to practice self-denial to an almost unreasonable extent, does not exist at the present time; and a man who now enters a specialty without making use of the opportunities beforehand, lacks the very qualities that distinguished the great specialists of the past generation." Doctor Ochsner thinks that a national organization should control this subject, and he regards the American College of Surgeons as a good candidate.

The choice of a consultant or of a specialist is a serious matter to the patient, which he naturally, in most instances leaves chiefly to his attending physician or surgeon, and when the latter advises his patient in an unselfish, careful, and conscientious manner, he

renders a service which is not always duly appreciated by the patient. But we know that the confidence of the patient in his doctor at such times is often betrayed either by selfish or mercenary motives influencing the doctor in the choice of another physician or surgeon, or by his venturing to do himself some important act which he knows he is not properly qualified to perform, and which therefore amounts to nothing less than gross experimentation upon his patients. For this reason, if justice to the patients and to qualified specialists is to be more uniformly obtained, it becomes increasingly necessary for the laity to be enabled independently, to choose men of desired ability from an accessible roster and by inspecting their individual specialist diplomas. The importance of this is set forth by E. P. Lyon, Ph. D., M. D., dean of the University of Minnesota, at the commencement exercises of Rush Medical College, June 13, 1917. After declaring that medical specialties are necessary, he said: "The safeguarding of the public demands some method of certification for specialists. This is perhaps quite as important as the primary certification or licensure. How is the average citizen at the present time to proceed in order to intelligently select a competent surgeon? The answer is: it cannot be done. Perhaps as good a way as any is that of the Minneapolis lady who went into a big office building, stood in front of the directory of physicians, closed her eyes and said a little prayer, put out her hand, and had her appendix removed by the physician whose name her fingers thus blindly hit on."

The Executive Board for Standardization of Specialists in the Various Branches of Surgery should be, *first*, a national one in order to secure uniform requirements in all the states. *Secondly*, its members should all be prominent or distinguished, each in his respective specialty. *Thirdly*, they should have the general endorsement of a leading representative national medical organization. *Fourthly*, an automatic succession in membership to fill vacancies as terms of office expire, would be an advantage. *Fifthly*, three such men would be sufficient as a subcommittee in charge of any one specialty. These requirements would be fulfilled by a board composed of the executive committees of all the surgical sections of the American Medical Association, including obstetrics. Practically all the members of such a board would also be members of the American College of Surgeons, a noble concurrent organization with similar aims, but of smaller scope. The high principles of this college would therefore automatically become active also in the enterprise of standardization, while under the auspices of the American Medical

Association, this board would be representative also of those surgical practitioners who are not members of the College of Surgeons. The American Medical Association stands most nearly for the entire medical profession of the United States.

The appointment of such an executive board for standardization of specialists, the outlining of its duties, powers, and mode of procedure, the determination of the exact requirements of candidates in these various specialties, as well as deciding the manner of certification of accredited specialists, would be duties for the House of Delegates of the American Medical Association to perform. The requirements for admission of candidates to these various specialties by such a board should be fully equivalent to the requirements for admission to the American College of Surgeons, whose members are very carefully chosen, and should be fully accredited and certified as specialists by the specialists' board without further process than the payment of a registration fee.

The writer's suggestions as to these requirements are approximately as follows: *First*, to begin with, the candidate should have (*a*) a diploma from a medical college in good standing; (*b*) a diploma or certificate for service as interne for at least one year in a general hospital of sufficient size to provide clinical observation of most of the commonly occurring disorders in every branch of medicine and surgery; and (*c*) a state permit to practice. He should also sign a pledge to avoid fraternal bribery. *Secondly*, he should serve at least three years as assistant to one or more masters in his specialty who are in need of such assistance, and who are themselves active members in good standing of at least two national organizations of men in their respective specialty. Such an assistant should receive a moderate salary and should not be permitted to practice privately. He should aid his chief in diagnostic, laboratory, and research as well as clinical work; and by engaging in such work himself he should gather material for original publication, at least for a creditable graduation thesis. These requirements should be standardized by a system of credits that would secure uniform equivalents throughout the United States. *Thirdly*, the candidate should pass a sufficient examination to show that he is not merely a mechanical operator, but an intelligent physiological surgeon; that he is not only familiar with the etiology, natural course, symptoms, and treatment of the disorders that he claims to have special knowledge of, but that he is also able to demonstrate their pathology and, if need be, his skill in their treatment. He should present, the results of creditable original research on some subject in his line, in a graduating

thesis; and additional productions should be credited according to their number and merits.

At each annual meeting of the American Medical Association, the executive committee of each of the surgical sections of the association, acting as a sub-committee of the specialist board with power to act, should officiate and give sufficient opportunity to candidates for these fraternal degrees and diplomas, to obtain them by presenting their credits and their theses to the respective sub-committees of the board, taking whatever examination that may be prescribed, and paying a registration fee which should not be returnable, and should be sufficient not merely to defray all incidental expenses and necessary expenditures, but also to pay for the publication, by the American Medical Association, of an annual official register of specialists, which should be distributed gratuitously to all recorded specialists, to all hospitals, and to all boards of health of states and larger cities, for general public use.

The American Medical profession in general, and the laity in particular, need to come to a better understanding of the fact that a real specialist among doctors of medicine is not so much one who claims that his practice is limited to a certain branch of the profession as one who has taken two courses of medical education: the first of about five years to become an average general practitioner, and the second of at least three years of special study and training, or its equivalent; and who, in the near future, should have a diploma for each course. We know that the laity now are frequently duped by mercenary, unprincipled, and venturesome men in our ranks, in whom they have helplessly put their trust. These wrongs will scarcely be eliminated unless the laity are provided with accessible authentic registers or directories from which they may choose reliable men and women for special medical services, without the advice of any doctor interested in their case. This condition is a stain upon the character of our profession that must be erased if we would preserve our self-respect as a body whose noble principles and high ideals are unexcelled.

Secondly, permit me gentlemen, to invite your attention to our deplorable mortality statistics. Competent authorities show them to be mostly conjectural and of no scientific value, because of the gross neglect of autopsies and other postmortem investigations in our country.

Dr. Horst Oertel, director of the Russell Sage Institute of Pathology in New York City, in his share in the "Report on Postmortem Examinations in the United States," by the Public Health

Hospital and Budget Committee of the Academy of Medicine of New York, makes the classic statement, "It is an interesting observation to the student of the history of medicine, that the development of scientific medicine and therapy in any country and in all nations has been inaugurated by the systematic performance of postmortem examinations, which made possible the establishment of pathologic anatomy. Its neglect has invariably been attended by stagnation and scientific decay." He shows that it was wholly by systematic postmortem study that it became possible for the great pathologists Morgagni, Richat, Corvisart, Lænnec, Rokitanski and Virchow in succession, to lay a firm foundation for the modern temple of scientific medicine in the midst of the morass and general chaos of superstition, mysticism, scholasticism and conflicting systems or schools of healing that formerly prevailed. He points out that even in the diseases caused by known microörganisms, we need the autopsy and the microscope to learn everything of practical value: how the germs enter, what parts of the body become involved and how, what are the characteristic cellular changes, etc.; and in diseases like arteriosclerosis, angina pectoris, the effects of alcohol, etc., there can be no progress without postmortem study. Dr. Oertel says that systematic performance of autopsies is indispensable for the collection of trustworthy mortality statistics, "that a correct scientific diagnosis of a disease, such as is demanded for a useful record, can be made only after death by one well trained in pathologic anatomy," and that "our present American statistics as kept by almost all boards of health in this country, *are extremely faulty and of no scientific value.* Even not considering those returns of the cause of death that are made worthless by neglect, stupidity and by intent, *all purely clinical diagnoses that are based on uncertain symptoms only, must remain pure conjectures that lack the necessary objective proof.* But reliable statistics are of the greatest consequence to a nation. Take alone the cancer questions, Is cancer really on the increase or only apparently so?"

E. H. Lewinski-Corwin, Ph. D., Executive Secretary of the same committee of the New York Academy of Medicine, made extensive inquiries during prewar years in the chief European and American hospitals, and found that only one-eighth as many autopsies were made in the United States as in Europe, in the same number of deaths. He says the reason is adverse public opinion and prejudice, which are equivalent to ignorance that we ourselves are to be blamed for.

Dr. John J. Walsh (in the Ecclesiastical Review, April, 1918)

says: "Nearly all of our real progress in medicine—that is the progress that stayed by us and formed the basis for ever-advancing knowledge—has come from postmortem examinations. Whenever and wherever the opportunity is afforded for many autopsies, medicine and surgery make great advances; an immense amount of human suffering is saved, lives are prolonged, etc."

Dr. Richard C. Cabot, an expert diagnostician of the Massachusetts General Hospital—a model institution—in an admirable work (paper) reports the percentage of clinically correct diagnoses in 3000 cases that came to an autopsy. In only three of twenty-eight disorders reported on, was the clinical diagnosis correct in over 75 per cent. of the cases. In twelve diseases it was correct in from 50 to 74 per cent.; in eight in from 33 to 50 per cent.; and in five in less than 23 per cent. of the cases. Dr. Cabot says that acute uremia is not an infrequent clinical diagnosis, but that in this study of 3000 autopsies and in his private practice outside of that, he has never met a case. He says that only thirty-one cases of cirrhosis of the liver out of eighty cases were recognized during life; that out of forty-three cases of cancer of the colon, eleven were not recognized, two of them not even after operation; that in thirty cases of nonamebic hepatic abscess, the diagnosis was made in only six cases, and that it could reasonably have been made in only three others. In twenty cases of cancer of the esophagus, it was not discovered in four cases because of anatomical peculiarities.

Samuel L. Rogers, director of the Bureau of Census of our Department of Commerce, at the request of the American Society for the Control of Cancer, made an inquiry by letter of 3500 physicians of whom 80 per cent. replied. The result was that of all the cases reported, only 58.3 per cent. were "reasonably certain;" all the others were "uncertain" or "unknown."

Our mortality statistics suffer vitally not merely from lack of autopsies; but also from being gathered by unscientific men and systems, so that "mere worthless tabulations of figures," resulted without statistical value, as our fellow, Doctor William Seaman Bainbridge says, in his creditable book, "The Cancer Problem." He says: "American methods and their results justified Professor Bashford (Director of the Imperial Cancer Research fund of England, when addressing the New York Pathological Society in October, 1912), to say that he knew more about the occurrence of cancer in the different native races of Ceylon, than his audience did about cancer among the different races in their own city. His criticism has not been answered."

The Registrar-General of England has worked out a table for fifteen European countries, for every year from 1881 to 1910 inclusive, which shows the number of cancer deaths for each 1000 promiscuous persons living, and also the number when corrected according to age and sex constitution; but he has omitted Americans because they could not furnish the correct details.

Louis B. Wilson, of the Mayo clinic, points out that it is a matter of real personal interest and importance for anyone to learn by a postmortem examination, what bodily defects, proclivities to disease and intercurrent affections his deceased relatives had, in order to be guided thereby in his own life, and that the force of this fact is shown in the great concern that the stockbreeder has to find out all about these features and the exact cause of death, when his blooded animals die. He says that when relatives of a dead person are made to understand this, and that the results of an autopsy will be carefully explained to them afterward, they become interested and cease to object to an autopsy. He also points out that the most nearly correct mortality statistics in the United States are from large charity hospitals. Here the patients are observed and treated most correctly, and get autopsies after death. But, he says: "these are more or less misleading when applied to specific cases in the estimation of family inheritance or life expectancy in the well-to-do. Mendell's laws as to heredity are of service only on a basis of accurately observed individual family incidence. In all those fields of investigation in which a knowledge of the exact cause of death is important, the necropsy stands in the first place." Likewise, he says: "that aside from infectious disease and accidents, most of the fatal diseases of mankind can be diagnosed with accuracy only after death by an examination of the body, both grossly and microscopically. This is particularly true of the three diseases that chiefly result in death of adults; namely, tuberculosis, cancer, and diseases presenting the cardiovascular renal syndrom." Wilson says: "that we should refer to the experience of the best large hospitals: that even in cases there observed for some time like cancer, the clinical diagnoses are correct in only about three-fourths of the cases, in tuberculosis in less than one-half and in cardiovascular diseases, in less than 40 per cent. of the cases—thus admitting to the intelligent laity, the severe limitations of the best of human medical knowledge when only clinically applied; so that the importance of exact study of the human body after death may become better understood."

The temple of scientific medicine that our profession in all enlightened countries occupies, is built upon the foundation of patho-

logical anatomy. This foundation was very laboriously laid, mostly by the toil of our European confrères. It has been so easy and inviting for medical men in America to imbibe freely at the European fountains, as welcome guests, in countries where public opinion and the laws on the subject, regard postmortem studies as an important part of modern civilization. But, while these our fundamental needs were freely supplied from there, we have permitted our general public to grow up in dense ignorance on this vital subject, and to cultivate a superstitious sanctity about the dead human body, that is akin to idolatry. The popular sentiment and ignorance on this subject in our country is a blot on the face of real intelligence. Our legislators even do not seem to know the difference between a decent autopsy and a student's anatomical dissection. Our laws concerning it are practically almost prohibitive, and seem warranted only on the supposition, that medical men in our country are largely ruthless desperadoes with a penchant for villainous mutilation of dead human bodies. We must first arouse the many members in our ranks who are indifferent on this subject. They must be made to see what a sacrilege they are committing when they, in the vesture and unction of scientific men, pledged to be votaries of truth and fact, will carelessly execute the last official document pertaining to the life of a human being, by signing it with a mere guess. They must be made to realize that their indolence and complacency in this matter implies turpitude, retrogression and decay in their professional career. The general public needs to be taught that the aversion and prejudice against autopsies in our country is not the offspring of real civilization. They need to learn that normal and pathological anatomy are not merely needed as a foundation for a rudimentary medical education, but that the normal growth, improvement, and evolution of such an education, and the proportionate good to the public itself, are directly dependent upon continuous systematic postmortem examinations and studies as a normal routine, at least in all cases where any doubt exists as to the exact cause of the death, and as to intercurrent or contributory affections, and in all instances where suspected hereditary taint or abnormalities deserve attention. The laity need to be assured, that a complete but respectful autopsy is not a desecration and does not necessitate disfigurement; that it constitutes a test of the merit of the medical or surgical service that was rendered; that it may reveal facts that are of great prophylactic value to themselves; and that it may contribute good to untold numbers in future. The various medical organizations in our country,

notably the American Medical Association, should espouse it as a duty to furnish suitable instructive articles on this subject in popular magazines and for the public press. Propaganda of this kind persisted in and uniformly endorsed by the individual testimony of all the more influential practitioners, would soon create sentiment in favor of autopsies. Not only would the laggard in our ranks then be compelled to fall into line, but our legislators also would soon see the light, and would hasten to restore and to preserve, in our country also, the chief support of medical science, which serves to man his greatest finite good.

When this wrong to our profession and harm to the public shall have been eliminated; and when all members in our ranks will measure up to just standards, then we can more consistently point to the noble principles and high ideals that guide our life and practice. While the medical profession enlarges the world by redeeming its uninhabitable regions for the general good of mankind; for itself, it reduces the sources of its usual income by similar scientific conquests. Its discoveries and inventions are freely distributed to the world and are not limited in use by financial restrictions. Live wires of scientific interest impel its votaries along unpleasant paths amid noxious surroundings and under repellant conditions, when hardships and fatigue would declare a halt. The call of human suffering from rich and poor, good and bad, friend and foe, receives willing attention without legal mandate, and often without reward or thanks. Of such men Voltaire could correctly say: "Men who are occupied in restoration of health to other men, by the joint exercise of skill and humanity, are above all the great of the earth. They even partake of the Divinity, since to preserve and to renew is almost as noble as to create."

THE BENEFITS OF STAB-WOUND DRAINAGE IN PELVIC INFECTIONS.

BY

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(With one illustration.)

THE benefits of stab-wound drainage in pelvic infections should command the attention of every surgeon who is desirous of improving the rationale of his technic. It is not the purpose of this brief paper to enter minutely into the detail of pelvic drainage, nor to discuss the many materials used in drainage, only in so far as the whole subject must be reckoned with to give intelligent judgment to any part. There is no field in the surgeon's work which is fraught with greater responsibility and a keener sense of judgment than that made necessary by a decision whether, in a particular case, he should or should not establish drainage. Certain types of pelvic infection need much freer drainage than others; in general, the more acute the process, the more urgent is the demand. Infection with oozing of blood from a traumatized area calls for freedom, while pneumococcus and streptococcus infections demand it. Fortunately perhaps the most common cause of pelvic infections is the gonococcus(1). When confined in occluded places like that of a sactosalpinx, the gonococcus soon dies; in unrestrained secretions, it retains an extraordinary longevity and virulence, and it is for this reason that most gonorrheal infections in the pelvis are better dealt with late. Then the convalescence is less stormy and drainage, when necessary, is of shorter duration.

Prophylactic drainage popularized by Olshausen, Sims, Keith and Wells during the decades of 1860 and 1870, soon became obsolete, giving way to the plan of drainage only in cases with actual collections of pus, infected fluids or necrotic tissue. Just how long tubes, cigarette drains or gauze do actually drain an infected area, is a debatable question. I am fully convinced, however, these agents are usually allowed to remain too long. Rubber drainage tubes should not be employed unnecessarily, they should simply effect the purposes for which they are used and should not act injuriously on the wound. They have performed their usefulness as soon as nature has formed an encasement about them of a thin protected

wall; as soon an this is established, drains of whatever nature should be removed. This will do away with a large percentage of post-operative sinuses. We think it is pertinent to add that the fewer thick rubber tubes admitted to the abdomen or pelvis for drainage purposes, the better for the patient.

The old dictum of "when in doubt drain" has given way considerably in the last few years, since the closer study of our patients

FIG. 1.—Sketch of patient after operation, showing the median line incision below the umbilicus completely healed; also showing slight discharge from the stab wound two and a half inches from the line of incision and six inches below the umbilicus.

pre-operative as well as at the table, has shown us that drainage was too frequently used and often improperly. The work of Dr. John G. Clark, of Philadelphia, has done much in late years to discourage the use of drainage in cases in which it was formerly considered necessary and showed a definitely decreased morbidity and mortality where drainage had been restricted.

An exhaustive study by John L. Yates, of Milwaukee, of the local effects of peritoneal drainage a few years ago, well merited the Senn medal which was awarded(2). He says: "Peritoneal drainage must be local and unless there is something to be gained by rendering an area extraperitoneal, or by making such an area a safe path of least resistance, leading outside the body, there is, aside from hemostasis, no justification for its use." However, so long as we have collections of pus and necrotic areas to contend with, we are forced to use such measures as each individual case may require(3).

Most of the complications and sequelæ are due primarily to inefficient mechanical drainage and are therefore preventable.

The question then that confronts us is, what kind of material should be selected for drainage and where and how should it be placed? So far as pelvic infection alone is concerned, and we are dealing with a collection of pus which has gravitated into Douglas pouch, the vaginal route, other things being equal, should be chosen. Wegner referred to drainage through the vagina as "Sims' greatest contribution" and even here, when rubber tubes are used with knots or T's on the end for retention, they are not without danger. I have had one case in which pressure necrosis with resulting recto-vaginal fistula occurred. When, on the other hand, it is necessary to open the abdomen from above to deal with lesions, we have to consider the future integrity of the abdominal wound when drainage is placed through it. When drainage is thus produced, it provides contact with a definitely infected area to one which in every possible manner we have endeavored to keep clean for primary union. One will be surprised at the number of primary closures of these wounds if the source of infection is guided away from it instead of through it.

I do not know who is responsible for the idea of stab-wound drainage, but it is one of the great factors which we can make use of as a prophylaxis against postoperative hernia.

When we consider the number of small hernias following the placing of drainage in the lower angle of the wound and the number of large hernias as a result of improper union on account of the infection of the whole incision by virtue of that drainage through the abdominal wound, should we not seek for some other method just as direct, just as simple and much safer?

The accompanying diagram (Fig. 1) shows the healed abdominal incision with the stab-wound drainage established on either side, capable of doing all that drainage would do in the midline. When this kind of drainage is done, it makes less difference in the length of time it may be left *in situ*, since the arrangement of the muscles is such as to completely close off this small opening whenever the drainage is removed. No cutting of anything but skin, fat and fascia makes it possible for the conjoined action of the internal oblique, external oblique and transversalis muscles to effect perfect closure of the wound.

Perfect results in wound closure make it necessary that like tissue layers come into close coaptation. Through-and-through closing of the abdominal incision was followed by an alarming number of

hernias merely because we failed to recognize the necessity of like-tissue approximation, and then after years of endeavor by way of closer approximation and the evolution of absorbable ligatures, we came to definite closure of the abdominal wound layer by layer.

Should we throw away these years of experience which have been fraught with anxiety, disappointment and failure, and still keep the wound open by a method which in most instances is harmful, mischievous and unnecessary?

CONCLUSIONS.

1. It should be our constant endeavor to close without drainage in so far as safety will permit.
2. Drainage materials should be removed earlier than the general practice now obtaining.
3. The great majority of all infected areas in the pelvis are suitable for cul-de-sac or stab-wound drainage.
4. The abdominal incision should be left free to close by primary union.
5. Stab wounds are securely and quickly united after the drainage is withdrawn, with no fear of subsequent hernia.
6. The musculature of the areas usually chosen for stab-wound drainage is our greatest asset to a speedy closure of the drainage opening.

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3. *Archiv f. klin. Chir.*, 1866, p. 51.

DISCUSSION.

Dr. Gordon K. Dickinson, Jersey City, N. J.—The matter of drainage is a misnomer. I do not believe that gauze drains when we stick it in a wound. It is a local irritant and because of that property it walls off to a certain extent the local process and makes things fairly safe. But we do have a wonderful system of drainage in the abdomen. Some ten years ago I made what I thought was the first study of the literature and presented my own work as to the value of the omentum in abdominal drainage, I came to the conclusion that the omentum, properly applied, will drain off more in ten minutes than any amount of gauze will take out in a day, and if there is a normal omentum, and if there is not a virulent streptococcus infection to deal with, you will have good results, no matter what you do. But I do not feel that gauze is an irritant and thus we gain our results. If I am compelled to leave behind at an operation a sloughing infected base, something that I feel is going to put a great deal of strain on the omentum and lymphatics, then I introduce a dam. I do not close the abdomen completely; I put

in gauze soaked with 1 per cent. iodine to wall off the place, and then in six weeks or later close the abdomen.

Major J. Henry Carstens, Detroit, Michigan.—Drainage is very good when we are trying to learn something about abdominal surgery. The late Dr. Joseph Price was a great advocate of the use of two gallons of water and a drainage tube. Some fifteen years ago we had a meeting of this association at Pittsburgh, and I among other members of the association performed some operations. Drainage at that time was still the subject of considerable discussion. Dr. Ross, myself and others performed operations on patients, and I believe I had one of the worst cases to deal with surgically on account of the large number of adhesions and the pus. Dr. Price said at that meeting a great deal about drainage and the importance of it, and I said we could get along without drainage in many cases. I operated on this patient and a great deal of pus escaped. I cleaned out the abdomen without washing it; in other words, I mopped it out, and sewed up the wound without drainage. Dr. Price and others thought this would be the end of that patient. Luckily, my patient recovered, while some of the other patients in whom drainage was used, died. Those cases impressed upon me the fact that drainage was not always necessary. Since that time I have drained very little.

If I have a case to deal with where there is pus, and if I have any doubt as to whether to drain or not, I puncture the cul-de-sac and drain in that way. I can see why I should make a new wound and another opening somewhere else where natural gravity will take place. I can see where one might drain in the posterior loin in a case of abscess or of pus in the abdomen, the gall-bladder, and so on, but I really cannot see why we should make stab-wounds. I do not do it, and my patients get along without any trouble. I sew up every one of them. As I have said, if there is any question about drainage in women, I open the cul-de-sac and put in a rubber tube for a few days and let the case go at that.

Major John W. Keefe, Providence, Rhode Island.—Drainage is a subject that we all have to contend with from time to time. Rubber drainage tubes in the abdomen most men have discarded to-day, so much so that a report from a cantonment coming to Washington in a case of appendicitis with a fecal fistula, the officer to whom this report came sent back to the cantonment to know why that patient had a fecal fistula, and it was found that the case had been drained by a drainage tube, and word was sent back that that officer be court-martialed for placing a rubber tube in the belly following an operation for appendicitis.

Now, most surgeons feel that a rubber drainage tube should not be placed in contact with the intestine. Undoubtedly an incision into Douglas' pouch is desirable in certain cases for the purpose of drainage.

Looking back over the literature in gynecology, one can see how many patients have died from placing drainage tubes in the pelvis, where the nurses withdrew every hour the serum that formed. As

soon as surgeons began to close the belly, and not interfere with nature, these patients recovered. I feel that occasionally it may be necessary to drain through the abdominal wall for work done in the pelvis. At one time, we all flushed out the cavity, using one or more gallons of salt solution, but we had very poor results. Rubber tissue in a pus appendix case no doubt is of some value in keeping the abdominal wound open, so that the wound may close from the bottom.

One cannot dispense with drainage altogether. I recall a recent case where a surgeon had removed a stone from the pelvis of the kidney and he sewed up the wound in the pelvis and closed the external wound; but the patient had a collection of fluid and some six weeks later we opened the wound and drained. After draining for a time we found that the kidney was so disorganized that it was necessary to remove it. So it is sometimes desirable to put in a drainage tube. It would have been better in this case if the surgeon had put in drainage early and, in all probability, he would have had union of the wound he had made in the pelvis of the kidney. Drainage is seldom of value following pelvic operations and may be harmful.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—Dr. Keefe has told us that when surgeons began to keep drainage tubes out of the abdomen, abdominal surgery progressed, better results were obtained. That is in part true, but I do not believe it is the whole truth. One of the reasons why we get better results now is because abdominal surgeons have been improving in their technic and drainage has become less necessary.

I, like every one else, have had to drain. I have saved many lives by drainage. Dr. Dickinson made a splendid point when he said the omentum is a good drain, but we must remember the omentum drains into the system and not out of it. If you have too much infection, you let the invading army overwhelm the system instead of getting rid of it. Just as I feel that the United States may admit foreign citizens faster that it can assimilate them, so the omentum may do that same trick, and overwhelm our patient before she can commence to eliminate and get up her powers of resistance.

I quite agree with Dr. Carstens and Dr. Keefe that whenever drainage is necessary, the best place to drain is through the cul-de-sac, if the patient is a woman.

One other word about drainage, to which Dr. Dickinson has already referred, namely, it is not alone the drainage that we do, but we put a scaffolding in to keep the healthy tissues away from diseased and this also retards the absorption of septic material and allows the system to take care of it.

Just a word or two about the rubber tube. I do not believe that any doctor in the Army or the Navy or anywhere else ought to be court-martialed simply because his technic is a little different from that of others. We know that our science is not exact. One man gets results by one method and another man gets results by another. The main thing for a man to know is his own technic, and his limitations.

I remember distinctly a little lesson I learned a few years ago. A young man had been with me for two or three years, as my assistant. One of the first cases he operated on I was called to see on the third day as the patient was doing badly. I opened the abdomen and found a lot of dirty fluid in the pelvis, put in a drain, and that woman got well. He was following my technic and did not drain, but in that particular case he did not recognize his own limitations, if he had, he would not have had this trouble. Such a case shows the personal equation, and we must not criticize too severely those who resort to other methods. When we put in gauze drainage through a stab-wound like the doctor recommended, through the vaginal cul-de-sac, unless there is something around it to prevent pressure on it where it comes through, serum will accumulate in the gauze. You can overcome this to a certain extent by having gauze pulled down every few hours, or, if you prefer, you can put it in a split rubber tube, so that the tissues through which is passes cannot squeeze it, and your results will be better. You do not want to put a drainage tube in contact with bowel that has been sutured or appendiceal stump that has been tied off. If it goes through the wall only a short distance, I cannot see any possible disadvantage.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I desire to express my agreement with the remarks just made by Dr. Bonifield. There are cases in which we cannot get along without drainage and in such cases you must make use of such drainage as you deem necessary. We find cases where nature has taken charge of the morbid matter, and there is no accumulation of pus. In other words, those are the cases in which by their intrinsic pathology you can get along without drainage, but there are cases where you will have to drain the accumulation of pus, particularly where the peritoneum is unable to cope with it at that time.

Dr. Yates (closing).—Many of the points that have been brought out in the discussion are really covered by the conclusions with relation to the use of drainage. One of these conclusions was that drainage was used too much, and that drainage tubes should be used much less than they have been in the past.

As to closing the abdomen without drainage, there are certain instances in which we must drain and in some instances where it seems best to drain from above. The paper was presented not for the purpose of establishing when and where not to drain, but to suggest that the primary incision should be left to itself to heal by primary union. There are instances in which it seems well to drain from above and sometimes from below, too. We all agree that cul-de-sac drainage is better when it seems practicable and adequate, but occasionally, when the other drainage is necessary, the cigarette drain is preferable to the rubber tube. I did not bring up the question of rubber-tube drainage, but the establishment of stab-wound drainage by such suitable means as the individual cases would indicate.

CASE REPORTS.

BY

CHARLES LYBRAND BONIFIELD, M. D.,

Cincinnati, Ohio.

Case I.—Miss H. L., aged fifteen, entered the Good Samaritan Hospital, February 3, 1914, on the Medical Service for tubercular peritonitis. She was transferred to my service on March 24th and on the 26th I opened the abdomen. At the time of operation she was very much emaciated and poorly developed. Finding that the disease involved both the uterine appendages and the appendix, these structures were removed and it was deemed necessary to drain. She developed a fecal fistula, but was able to leave the hospital on April 19th.

I did not see her again until June 28, 1918. Dr. Richards of Dayton, Ky., asked me to see her. I arrived at her house at about 9 P. M. and was very much surprised to see a well-developed young woman of good nutrition. I learned that the fecal fistula had persisted, the opening in the skin having contracted to about the size of a lead pencil, and the amount of fecal matter discharged had not been large and consequently had not annoyed her a great deal. About forty-eight hours before I saw her, the bowel had protruded through the fistulous opening, and since that time the bowels had not moved. On turning down the bed clothing, I saw a mass of intestine, bright red in color, dotted with black areas from which bloody serous fluid was trickling over the skin in various directions. It was evident that the bowel was strangulated and her only hope was immediate operation. She was sent to Speer's Hospital, where I operated on her as soon as the necessary preparations could be made.

When the opening through the abdominal wall was enlarged, old firm adhesions were found not only binding the intestines to the abdominal wall, but the various coils of intestine to one another. It took me several minutes to separate a sufficient amount of the bowel to be able to determine the exact condition with which I had to deal. Finally, I loosened the cecal end of the ileum and tracing it found it disappeared into the mass which had been extruded. I then, for the first time, recognized that the cecum had turned itself wrong side out through the fistulous opening. I turned it right side out again, but found the bowel so damaged from the strangulation that it was necessary to resect about 3 inches of the cecum and 2 inches of the ileum. I made an end-to-end anastomosis with chromic catgut and closed the wound without drainage.

I have not had an opportunity to see the patient since, but learn she had a stormy time for several days, the incision suppurated and finally broke open and a small fecal fistula still exists.

Case II.—Mr. J. S., aged thirty-eight, ticket agent, on the morning of Sunday, June 30th, about 8 A. M., got into an altercation with another employee of the railroad. The latter drew a 38-caliber Colt revolver, officers model, and fired five shots at him, a distance of about 6 feet, three of which took effect. My patient grappled his antagonist, who was 50 pounds heavier than himself, got him down and beat him until he called for help. They were then separated and the victim of the shooting walked some distance to his home and Dr. C. D. O'Hara, of Williamstown, Ky., was called to see him.

He found that one bullet had passed through the neck, another had entered the abdominal wall a short distance above and a little to the right of the umbilicus, and another had apparently entered the back about the crest of the ileum. Dr. O'Hara cleansed the wounds, put him to bed and telephoned me that he would bring him to the Good Samaritan Hospital.

There being no ambulance in the town, the doctor secured an automobile, on which he placed a mattress, put the patient on it and started with him. The road was not smooth and the progress was necessarily slow, the distance being over forty miles, so that it was about 4 P. M. when he arrived at the hospital.

He was taken at once to the operating room and anesthetized and a median incision made. A large quantity of clotted blood and fecal matter from the small intestine was sponged out. I found that the bullet had gone from above downward and toward the right side. It had passed through the transverse colon making two openings, which were closed with chromic catgut sutures. It had passed through the ileum making two openings that were so large that they could not be closed without too much narrowing of the calibre of the bowel, so about 3 inches of the ileum was therefore removed and the ends united with a Murphy button. It was then found the bullet had proceeded through the cecum and these two openings were closed as those in the transverse colon had been. After searching the entire intestinal tract for further wounds I closed the abdomen. On account of the soiled character of the peritoneum, drainage of plain gauze wrapped in iodoform pulled through a split rubber tube was used. To save time through-and-through sutures were employed in closing the incision. The wound in the back was enlarged, fragments of bone from the crest of the ileum and the bullet were removed and drainage inserted. What became of the bullet that perforated the bowels I do not know. Until I had enlarged the bullet wound in the back and secured the bullet, I was under the impression that it had been made by the one fired from the front.

I saw him the following morning and found him in good condition. I left that evening for my summer vacation. He left the hospital July 31st, in good condition. I learned subsequently that he is quite well.

Case III.—Mrs. M. of Dayton, Ohio, aged fifty-six, noticed a mass in the lower abdomen on the right side. She consulted a physician in Dayton, who very wisely had *x*-ray plates made of the abdomen and made a diagnosis of cancer of the cecum. She entered the Good Samaritan Hospital, June 19, 1918, and after inspection of the *x*-ray plates and a physical examination, I confirmed the diagnosis. On June 20th I opened the abdomen and removed the portion of the bowel here shown, which is the head of the cecum with appendix attached and some of the ileum. The end of the ileum was stitched to the side of the large bowel, thus making the canal as nearly like it was originally as possible. She left the hospital July 20th and I have not seen her since, but understand she is doing very well.

DISCUSSION.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I feel deeply indebted to Dr. Bonifield for this case report. He says in the report of his first case he had a fecal fistula following his operation which may or may not now exist, and that it followed the union of the ileum to the ascending colon. Is that right, doctor?

Dr. Bonifield.—That is right.

Dr. Noble.—And it was done by end-to-end anastomosis. I would suggest, from my own experience in this line of work, that such an accident can be prevented and should be prevented by a lateral anastomosis of the ends of these viscera rather than an end-to-end anastomosis. The technic of an end-to-end anastomosis to me is associated with almost impossibility of perfect security—perfect mechanical security—and freedom from contamination of infection, while a lateral anastomosis can be made, as in a gastroenterostomy, with a security against mechanical defect as well as infection, and if the procedure be conducted along this line, I believe that fecal fistula will disappear.

Relative to his last case, a point of pathological interest is demonstrated in the presentation of this specimen. We see here a malignant tumor at the head of the colon. A cancerous colon produces tumors associated with the first segment without obstruction, and at the lower or lateral segments they produce strictures without tumor formation, features of decided significance when it comes to the matter of diagnosis.

Dr. John F. Erdmann, New York City.—In regard to fistula in cases of tubercular peritonitis, every one who has operated upon cases of tubercular peritonitis and used drainage knows that a secondary fistula is from the disease itself, and not from the use of the drainage, unless pressure necrosis results from too long retained drainage structure. Everyone who has operated upon cases of tubercular peritonitis has gone through this experience.

With reference to end-to-end anastomosis, I have done lateral implantations and have done end-to-end implantations, and have had fistula following both methods.

In a recent number of *Surgery, Gynecology and Obstetrics* there is an article by Balfour in which he strongly advocates end-to-end anastomosis of the small intestine with the large, and I want to say in connection with that article that last week I had a man in our clinic who had been operated for a cancer of the appendix. I should judge he had a fistula after the removal of the appendix for some reason or another, and upon exposure, after a difficult dissection, I found he had an eroding ulcer at the ileocecal valve which necessitated the removal of the cecum and a portion of the ascending colon and a portion of the ileum. In addition there was an immense edematous dilatation of the distal end of the ileum. After the method advocated by Balfour and brought out by Mayo, although I am sure the operation was done by the late Thomas H. Manley some twenty years ago, an anastomosis was made without trouble, and owing to the fact that we knew we might have fecal disturbance, I drained, as I do in all my cases where there is a possibility of any fecal infection or leakage. It is as possible in end-to-end anastomoses to be careful of the asepsis and to guard against infection as it is in lateral anastomosis. We have trouble in our gastroenterostomies because the flora and fauna are favorable to infection in the jejunum now and then, although they are not supposed to be. And in 10 or 15 per cent. of these abdominal operations you will have the serum accumulation contaminated even when taking the greatest possible care.

In our end-to-end anastomoses, I do not see any reason why Dr. Noble should say we have more dangers of infection. The lower down we are in the scale, the more likely we are to get multiple foci of infection. The higher in the intestinal canal the less the source of infection. Therefore, the higher up you are, although not advocating it, the less care need be taken. You must take care in the preparation of the patient and in the after-care in your surgical work.

I believe the fistula in Dr. Bonifield's case was a tubercular fistula, pure and simple, and not a drainage fistula.

Dr. Bonifield (closing).—In regard to end-to-end anastomosis in the tubercular case, I did it because I could do it more easily. As I tried to describe in the case report, everything was adherent from the old tubercular peritonitis, and it would have required longer to have separated the bowels enough to do a side-to-side anastomosis. I did what I thought was easier, because time was very important. I did not want to break up adhesions because, with this infectious condition of the bowel, the bowel having died, I knew I would have infection, and I did not want to scatter it.

DOES SURGERY EVER CURE A CASE OF CANCER?

BY

MAGNUS A. TATE, M. D.,

Cincinnati, Ohio.

THE word cancer still conveys to the mind a hopeless malady, and to physicians a dreaded case, because we are still seeking the cause and treatment is often of no avail. Discouragement and hopelessness are usually written upon the face of one afflicted, and many will not undergo the ordeal of surgery to attempt a betterment of their condition.

That a complete eradication of the disease is questionable in most cases, is usually a foregone conclusion. Has education brought better results? I believe it has. Does the removal of growth, when taken in its incipiency, result in a cure? Is the lapse of three years without a recurrence a fair test as to whether there be a cure? These and many other questions are constantly before us and opinions are widely divided.

My experience leads me to this conclusion: unless there be evident metastases and the patient can stand operation, it is our duty to mankind to operate without delay, even if there be only a temporary improvement.

Personally, I would prefer to die on the table under such circumstances, than undergo the prolonged suffering incident to the disease, but unfortunately many will not accept my conclusions.

A hopeless case, where there is no chance for even the prolongation of life, should never be subjected to surgery. I am becoming more and more impressed with the idea that we are gaining ground, not only in the education of people, in our technic, in our judgment, but in the adjunct treatments we are now employing, for surely results justify this statement.

The destroying of cancer of the cervix by heat has long been under discussion, and if there be no other involvement, and it is thoroughly burned out, a cure will follow. That I believe to be a correct statement, and to substantiate it, I select the following case for report.

Mrs. T., aged forty-five, was sent to me by Dr. W. Schultze, of Cincinnati, with the diagnosis of cancer of the cervix, which was readily confirmed upon examination. Patient had been bleeding over a period of six months, and only consented to operation because she feared death from the repeated and terrific hemorrhages. She entered the Good Samaritan Hospital, in a very critical condition. I found a large cauliflower growth half filling the vagina. My first impulse was not to attempt any form of operation until the bleeding had temporarily subsided, but as it continued after a three days' stay in the hospital, and her condition being so precarious, we decided to go ahead. Operation June 16, 1916, a cupful of growth being curetted away. A careful, slow Byrne operation was then done and the patient left hospital in two weeks. It was some four months before she regained sufficient strength to sit up all day without fatigue.

In January, 1918, the patient complained of increasing abdominal pain, with at times vomiting spells. Notwithstanding there was no evidence of a return of the malignancy, I thought best to temporize, but there being no improvement I did an abdominal section in March, 1918. I found a chronic inflamed appendix which I removed; also took out the remains of body of uterus with tubes and ovaries. No evidence of malignancy found in abdomen.

The laboratory findings, which were positive with the first operation, now gave a negative result with different sections of the remains of uterus. Her recovery has been complete, she has gained strength rapidly, and seems to be a well woman.

The second case is one in which I offer no explanation of the conditions as found at operation, nor of the results obtained.

Miss D., referred by Dr. Berlin, of Chattanooga, Tenn. Patient, aged thirty-two, had noticed a gradual enlargement of abdomen for the past six months, an increasing length of a painful menstrual period, and at times much abdominal pain. Consulted a number of physicians and obtained the diagnosis of a fibroid. In six months had lost 20 pounds, her weight at present being 94 pounds, was getting weaker daily; had had numerous fainting spells, and could no longer hold her position as bookkeeper. The tumor mass extended to the umbilicus, firm on palpation as if a fibroid, abdomen contained fluid. I was unable to state the nature of the growth but did not believe it to be a fibroid.

Operation at Bethesda Hospital, July, 1915. Abdomen contained about a half gallon of bloody stained fluid; omentum studded with many small hard nodules; growth found to be from the right ovary, left normal, and the uterus slightly enlarged, pushed over to the left and front. The diagnosis of malignancy was made and we decided to close abdomen without removal, but in attempting to liberate a few adhesions, a part of tumor mass came away necessitating its removal, which was done with great difficulty. The tumor was the size of a six months' pregnant uterus and weighed 8 pounds plus. The abdomen closed without drainage.

An unfavorable prognosis was given to friends, the case fully

discussed and explained, and that she would probably succumb within the next three days.

Macroscopically the mass appeared to be malignant, and this opinion was confirmed microscopically by Professor Woolley of the University of Cincinnati. Result, an easy convalescence, and she left the hospital in three weeks, gradually gained her strength, is now in perfect health, and was married in May, 1918.

I make no further comments as to diagnosis or prognosis, and all of my explanations I am happy to state have gone awry.

X-ray is questionable in many cases, but that it is valuable as an adjunct to treatment is now conceded, and while its harmful effects are pronounced in some cases, its beneficial action is so manifest in others, that very often it is worth a conscientious trial. This is now a treatment with many following the removal of breast.

The third case, that of Mrs. B., was referred by Dr. Teachnor, of Leesburg, Ohio.

Operated September 22, 1916; removed tubes and ovaries. In May, 1917, she returned for examination, as a physician had found a mass to side of uterus which was causing pain. Examination: The uterus was found to be twice the size of normal, a slight offensive discharge, watery in character, bleeding at times but never a hemorrhage, and a mass immovable, the size of an orange, to the right of uterus. Operated May 18, 1917. Uterus removed but the mass could not be, as it involved the whole of right broad ligament extending to the pelvic floor. An oblong mass, larger than a good sized orange, sections of which were found macroscopically and confirmed microscopically to be malignant.

Mrs. B. left hospital at the end of three weeks much discouraged, but I persuaded her to go to Dr. Goosman, who gave her intensive *x*-ray treatments, both vaginally and abdominally over a period of weeks, about twenty in all.

In February, 1918, a hernia developed in the line of scar, and I again operated March 26, 1918. The tumor mass which had been in the right broad ligament had entirely disappeared, and not a trace of any abnormality was found in the abdomen. Patient is now doing nicely, with the exception of an ugly ulcer below and to the left of umbilicus in the abdominal wall, the result of an *x*-ray burn.

In August, 1918, I dissected out all of this burned tissue, and it was found to be mostly fatty, not malignant. It will take some time for granulation tissue to fill up the cavity, but the patient is comfortable and able to get about the house.

I have selected these three cases as the answer to my query, and it is the experience of such cases with such results, that give us courage to at least try and do our best with this apparently hopeless disease.

DISCUSSION.

Dr. William Seaman Bainbridge, New York City.—Unfortunately, I must answer Dr. Tate's question in the negative. Surgery does not cure cancer; it may remove the cancer, and may relieve the patient of the disease, but the tissues once having become cancerous, are never returned to the normal. I simply draw attention to this point, which is fully in accord with Dr. Tate, and to emphasize the importance of more clearness in the terms used in relation to cancer. In fact the term "cancer" itself, is an unfortunate one because it is not a disease but a group of diseases.

As we are lengthing the discussion in conjunction with the subject of cancer, I desire to say a few words in regard to the outlook to-day, especially in relation to the cause and the cure.

The whole trend of investigation points not to a single cause, but to a number of causes of cancer. There is reason, too, for the belief that the disease to which the term cancer is applied is still a composite, despite the fact that syphilis, tuberculosis, actinomycosis, blastomycetes, and even leprosy, which were formerly confused with cancer, are now known to be separate entities, each with its specific cause. Who can tell to what further extent this process of differentiation and isolation may lead? The time may come when carcinoma and sarcoma will be separated into diseases undeniably distinct one from the other.

While this complexity of etiology remains unsolved, the prevention of cancer cannot become a truly practical problem, and the only methods which can be recommended with reasonable likelihood of diminishing the prevalence of cancer are measures which have for their purpose the elimination or avoidance of all forms of chronic irritation.

Pending the time when the cause or causes of cancer shall have been discovered, and when it will be possible to cure the disease by other means than by surgical removal, what is the outlook for the cancer problem and the cancer patient? In the light of modern cancer research is the prospect for the solution of the problem a hopeful one? Are we justified in encouraging the belief that the outlook for the patient is less despairing than formerly?

The study of the various phases of the cancer problem must convince everyone that the concentrated effort of so many earnest and intelligent investigators is slowly but surely clearing away much of the mystery which for centuries has obscured the questions of the initiation and the progress of the disease.

With the careful clinical and laboratory examinations to which we now know all patients should be subjected when they present themselves for treatment, there is justification for the belief that in future a progressively smaller and smaller proportion of cases of cancer will be wrongly diagnosed, and consequently wrongly treated.

With the campaign of education directed against the neglect of the many small things which may lead to the graver condition known as cancer; with the increasing mastery of the predisposing

causes of the disease, and with the greater willingness on the part of individual patients to present themselves for surgical treatment for its early manifestations, there is hope that the future will be marked by a progressive decrease in the number of persons who come within the category of those having inoperable and irremovable cancer.

With the perfection of surgical technic which characterizes modern practice, and with the intelligent utilization of the various adjuvant methods and measure which may be employed to alleviate suffering, the lot of those who are no longer amenable to surgical cure is certainly far less miserable and hopeless than was that of persons similarly afflicted even a decade or two ago.

While it cannot be gainsaid that the cancer problem to-day is still fraught with perplexity and uncertainty, one indisputable fact stands out in bold relief, serving as both guide-post and danger-signal for the present and future, if cancer cells be cut out soon enough a permanent cure is affected. This alone is sufficient to warrant the statement that we are "traveling hopefully."

Dr. Edward J. Ill, Newark, New Jersey.—There are some factors which make a case curable and other cases incurable. First, the age of the patient. The younger the person, the more malignant the disease. The older the person, the more likely of the condition being curable. Some pathological findings promise absolute cure. For instance, the papilloma of the ovary, where the papillary masses remain inside and have not broken through the enveloping layer. It is a safe operation and the prognosis is good, provided you do not tap the tumor and have taken it out as a whole. I have never seen a papilloma of the ovary remain well after it had broken through the outer layer.

The second form of malignancy that will likely remain well after operation is the carcinoma that occurs in the body of the uterus. I have not had any returns in twenty years, provided that during the operation, direct implantation of cancer cells has not taken place.

Dr. Bertha Van Hoosen, Chicago, Illinois (by invitation).—After listening to what Dr. Bainbridge has said, I feel assured that you will be glad to hear a report of some work that I have done along the line mentioned by him in hunting for something besides surgery to relieve carcinoma patients. I have been impressed for many years with the impossibility of telling definitely whether a case was operable or not. Those cases I thought were operable have had a speedy return when I had done my best surgery, and those in which I thought I was foolishly subjecting them to operation did not have a return.

I began three years ago, on the basis that the etiological factor of carcinoma was a protozoa, treating all inoperable and incurable cases with emetin. During the past three years I have used emetin in various ways in small doses daily subcutaneously, in larger doses subcutaneously, injecting the emetin into the growth, and I have also given it intravenously. I have found that with the subcutaneous injection of the larger doses of emetin at intervals I always got

a result and in some cases, such remarkable results, that I kept working on this line. I have had absolutely no results in any case by the injection of the emetin into the mass. I have had no results that would compare with the results that I have had with the intravenous injection of large doses of emetin, 9 or 5 grains intravenously. One of these cases I would like to report to you. This case has been seen by Dr. Emil Ries a number of times. She was brought to me by Dr. P. T. Burns of Chicago. She is a woman, thirty-three years of age, a twin. She had swelling in both breasts a year ago, but it passed off without leaving any induration or lump in the breast. In December, 1917, she had a lump in the left breast. This was followed by other lumps in the left breast, and later in the right. The patient was a refined woman, but was in poor circumstances. She had had hardly enough food, and did not consult a doctor until metastases had covered the entire trunk with the exception of the upper part of the head. She was blind in both eyes, due to the infiltration of the lids, and tears were flowing all the time down the side of her face. Not only were there metastases all over the body, no part being free except the legs and arms, but the infiltration was very great. I saw her the first of May. At the time we thought it was a case of leprosy.

For diagnosis I made a 2-inch incision on one side of the nipple, and with my finger scooped out some of the nodules. I also took out one of the metastatic nodules that was the farthest away from the breast, almost at the upper part of the thigh. Both of these showed medullary carcinoma growing rapidly. I then gave her the emetin treatment.

The patient was taken to the operating room at 12 o'clock Sunday morning, and 9 grains of emetin were injected through a vein in the arm. About thirty seconds after the emetin had been injected she threw back her head, and became absolutely pulseless and breathless. We gave her artificial respiration and stimulants of camphorated oil, and kept up artificial respiration for one hour. At the end of that time she was breathing and had a fair pulse. She vomited every now and then, but remained unconscious. Two hours later she became very restless so that it took four persons to keep her on the operating table. She was still vomiting occasionally, and a little restless until 8.00 P. M. when she spoke with difficulty and we let her go to sleep. She slept soundly nearly all night, and in the morning she felt much better. At the time I took out this lump it was impossible to draw the edges of the wound together on account of the infiltration. At the end of a week I took out a lump from the right breast and one gland as large as an English walnut from the axilla. Both of these showed medullary carcinoma. Then I gave 4 grains of emetin to her intravenously, with almost no reaction. She vomited once or twice. Two days after this she was seized with diarrhea and had involuntary movements for ten days. This was fortunate for by producing vigorous elimination through the bowels is about the only way that you can expect to pull these patients through with treatment by emetin. I did not give her any

more emetin until the end of two weeks, when she had 4 grains. That is all the treatment this patient has had. These nodules have practically all disappeared. From time to time, I have had sections made of nodules still remaining, one on the shoulder, one on the breast, two on the neck. One was removed as late as the 28th of August. They have been seen by Dr. Emil Ries and others who have pronounced them nonmalignant. The patient weighed 85 pounds the first day of July; she now weighs 101½ pounds.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—What I have to say will pertain very largely to the interesting findings and results given by Dr. Van Hoosen. There is no doubt that Dr. Bainbridge has sounded a cardinal note in calling our attention to the influence that toxemias have in the production of cancer.

Approaching the subject from another side, I will say that recently I had a case that was operated on three years ago for far advanced cancer of the breast, which was judged so by competent microscopists. It returned two or three times, and the woman was reoperated, and then the disease became so disseminated that it was impossible to reach all of the carcinomatous tissue, and surgical intervention was no longer had. But in that case, when the patient was first seen about four or five years ago she looked twenty years older than when I first saw her. She died recently, three years after the operation.

Major J. Henry Carstens, Detroit, Michigan.—I have had a number of cases where on examination of curetings the disease was pronounced cancer. I took out the uterus within a few days in those cases, and those patients are apparently well ten and twelve years afterward.

With regard to the remarks of Dr. Ill, I have operated on any number of cases of cancer of the fundus of the uterus and those patients have remained well for ten and twelve years thereafter. In some cases of cancer of the breast that I have operated on early, and have not had a recurrence. My experience has been similar to that narrated by Dr. Van Hoosen, namely, in those cases where I thought the disease would not recur it did, and in cases where I expected recovery they did not recover. So we have to keep on in the same line and encourage these patients, try to help them, and not discourage them. Possibly work along the line indicated by Dr. Van Hoosen will finally help us to solve this great question of cancer.

Dr. G. Van Amber Brown, Detroit, Michigan.—I desire to briefly relate a case which came to me five years ago. She was fifty years of age. She had a large mass in and almost completely filling the pelvis. The omentum was adherent to it and the intestines likewise, so that I could not see any place to start its removal. However, breaking up adhesions I pushed back the omentum and intestines, moving my hand around under this great mass it was found to include the broad ligaments, ovaries, tubes and uterus. I lifted it out, tore right down into the base of the pelvis, tearing the body of the uterus from the cervix. I did not ligate the ovarian or

uterine arteries. There was no place to ligate, I could not find them. There was no hemorrhage, I waited for a few minutes and closed the abdomen. This woman has recently been at my office; I have examined her carefully, and there has been absolutely no return of the disease. The cervix is movable, and there seems to be a perfect cure in this case. She has two sisters, one on whom I did a hysterectomy for carcinoma of the cervix twelve years ago, and another one since that time for carcinoma of fundus. These two sisters are living. The report from the pathologist stated that the growth was a cystadenocarcinoma.

GALL-BLADDER DISEASE AND ITS DIFFERENTIAL DIAGNOSIS.

BY

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That rather definite and conclusive diagnosis of gall-bladder disease can be made clinically is testified to by all surgeons. One can practically make the diagnosis of gall-bladder disease in the course of a carefully taken history.

The sex preponderance is in the female and as Deaver aptly puts it, "beware of the female fair, fat and forty, or past, who belches wind." Nevertheless, in the great proportion of my case records, the year of onset, or early visitation of symptoms is between twenty-five and twenty-seven, a few as early as eighteen, and one, a common duct case on whom I operated, gave a history of jaundice following colic at fourteen, the operation being done by me when the patient was seventeen.

Devoting a bit of extra time to a consideration of the symptomatology, the patient may tell you that for a long period of time, even years, she has complained of food distress of a rather peculiar character, of a sense of weight or foreign body pressure after eating, and that certain articles of diet, chicken, bacon, etc., will induce an attack of discomfort, associated with belching, a sense of constriction, necessitating loosening the corset, etc. For years I have termed this stage the prodromal stage of gall-bladder disease, as it precedes the actual colic for a varying period.

The colic or cramp is described as being in the upper right quadrant, without extension; with extension into the back, lumbar zone; up the back, under the shoulder blade; in the space between the shoulder blades; in the left shoulder and occasionally in the left and right portion of the neck. Frequently and usually when the stone is in the cystic duct, the colicky pain is said to travel across the midline upward, under the left nipple and breast (pseudo-angina). The attacks are very prone to occur between 7 P. M. and 1 A. M., in marked different relationship to the pain in ulcer of the duodenum.

Many patients have an aura several hours before the onset of the colic. In other words, they can definitely state that an attack will be due in so many hours.

Food intake does not relieve a colic, although hot drinks and alkalies may. Emetics, by inducing a relaxation of the spasm, the same as vomiting without induction, may relieve the pain.

There are many women in whom the first attack of pain occurs during pregnancy, or following delivery. Too much stress cannot be placed upon this fact. A large proportion of my patients have stated that their first colics were during pregnancy, or immediately after confinement. This selective period in life is explained by a super amount of cholestrin, etc., in the blood at this time. The pain in the gall-bladder colic is so severe as to require sedatives and anodynes, frequently in very large dosage, while in ulcer of the duodenum, etc., the use of an anodyne is most unusual.

Jaundice is a symptom or sign made much of years ago, but now accepted only as a confirmatory evidence of some obstruction to the outflow of bile, or some destructive blood condition, as in hemolytic jaundice, etc. In fact, jaundice is a rarity in the majority of gall-bladder diseases and when present has followed either the transit of a stone through the duct, or a temporary impaction. Jaundice is frequently present in both intrinsic and extrinsic diseases of the duct, blood and glandular systems.

Infections play an important part in the production of jaundice. A cholecystitis will often be accompanied with jaundice. General sepsis, following appendicitis, is followed in many instances by jaundice, the gravity of which is early recognized by the clinicians, etc. Recall then that the absence of jaundice is as important in gall-bladder disease as its presence is in diseases of the duct, spleen and in infections.

Loss of Weight.—Frequently a greater loss of weight is seen in a given short period of time in gall-bladder involvement than in many cases of malignancy. This loss is to be assigned to several sources, the limiting of diet, to improper metabolism due to impaired bile, and also to pancreatic complications.

The urine is prone to contain evidences of bile even if no common duct obstruction exists. Many positive observations are recorded in acute cholecystitis without duct obstruction. In duct obstruction the urine is deeply colored and spoken of by the patient as molasses-like in appearance.

Temperature exists only in the presence of an acute condition or in the chronic empyemas, an elevation of one-half to one degree.

Cholangitis is more than likely to give a step-ladder chart with chills intervening. Charcot's fever, so-called, is due in all probability to a ball-valve stone giving rise to temperature when impacted, and fall when the spasm relaxes and the stone is released sufficiently for the bile, etc., to flow through into the intestines.

On examining a patient with gall-bladder disease, one observes the skin and conjunctiva for jaundice or pigmentation. Jaundice without colic should cause one to hesitate in the diagnosis of cholelithiasis and should call for a careful family history, blood analysis, etc., with the view of eliminating disease of the spleen (hemolytic jaundice), and also in view of the cause being a malignancy. It is a fact that malignancy is imposed upon gall-bladder disease (cholelithiasis) in fully 4 to 8 per cent. of all long duration cases, and that a jaundice that is intermittent, or one that clears up quickly, is due in all probability to the biliary system being involved with or by a calculus. That jaundice deepening in color with or without ascites is prone to be of a malignant origin, at the same time, it must be recalled that an occasional stone impaction simulates a malignancy in its jaundice production.

Hemolytic jaundice gives urine and blood changes that are very definite. The jaundice is usually of a lemon color, sometimes deeper. The stools are never clay colored and there is no pruritis. There is a distinct family history in many of the patients.

Pruritis is a disagreeable sleep and peace-destroyer, is in early evidence in all patients with jaundice and frequently with those in whom the pancreas is involved. In examining these patients evidences of pruritis present themselves as long scratches or small petechial spots, due to both conscious and unconscious scratching.

When the condition of jaundice has existed for some time, blood changes due to absorption of certain bile elements and the loss of the lime salts are productive of ecchymoses. These evidences are *definite* contraindications to operation.

The stools in nonobstructive or nonjaundice producing biliary diseases are not modified, while in the obstructive or jaundice producing variety, the stool is characteristic clay or putty colored.

On palpation, one obtains in many instances the Robson and Murphy signs, in addition to the evidence of a mass in some cases both of acute and chronic cholecystitis. The pain or tenderness is superficial and anterior, in contradistinction to the costovertebral angle pain in renal calculi.

The temperature varies depending on whether there is an infective or gangrenous process present; the same may be said of the pulse.

This latter in gall-bladder disease is slow as a rule, except in the presence of an infectious process.

Gangrene of the gall-bladder presents in addition to the above, the usual point of tenderness associated with gangrene of the abdominal viscera.

Leukocytosis is not so diagnostic as in acute appendicitis, but frequently affords the same relative degree of information.

Straining Stools.—Stones may be found, but the infrequency of finding stones and the definiteness of symptomatology leads the practitioner of the present day to forgo the procedure.

The *x*-ray plate may show a shadow if lime salts are in the stones. Shadows are quoted as being in evidence in about 50 per cent. of all gall-bladder cases. Therefore, the absence of a shadow does not disprove the presence of a stone or stones.

ULCER OF THE DUODENUM AND STOMACH.

The preponderance of ulcer of the duodenum is in the male. The physical make up, as far as our cases present themselves, is that of slender, wiry variety and frequently classed as neurasthenics, usually between twenty-five and thirty-five years of age and non-alcoholics in habit. Among the earlier evidences that the patient speaks of are a sense of burning in the pit of the stomach, pyrosis, sour brash, belching, etc. That these symptoms arise from fifteen minutes to four hours after food intake and are relieved by sodium bicarbonate, sugar-water, aerated water, milk, cracker, etc., each patient having some favorite remedy for relief.

The pain complained of is always apologized for as not being a true pain, but rather a hunger call or uneasiness. Morphine is never demanded for relief, nor anodynes of any variety; no call to undress or lie down, but very soon the patient learns to use some household remedy. He will state that later on his symptoms became more defined, that he can, or could, tell when his next meal is due, as he has learned that the meal will relieve his distress for some time. Frequently he all but sets his clock by the gastric experience—10.30 to 11.30 for pain and relief by food; 4 to 5 P. M. for relief, and occasionally, after a hearty night meal his pains will commence betweeen 2 and 5 A. M.

There is little or nor loss of weight, no evidence of cachexia, because although he may be on a diet, his frequent intakes to appease his hunger sensation keep up his body weight.

He will tell you that he has periods of distress and longer periods

of relief; that the distress, as a rule, ceases suddenly and that he can eat about anything for weeks to months. This statement in itself is about all that is necessary to make a diagnosis upon.

His pain sensation may occasionally be said to go through the back, but is usually anterior and to the right of the median line.

As the disease advances his symptoms may become less definite, but sufficiently characteristic with his early history, to prevent our falling into error in diagnosis. Later on he may have the evidences of an obstructive lesion, shown by occasional vomiting, the vomitus tontaining food taken two or more meals back and large quantities, in other words, a cumulative meal vomitus. Or, by feeding certain agents, as raisins, or string beans, etc., and lavaging, the stomach cwelve hours afterward, will bring up distinct evidence of the aforesaid test meal.

When obstruction is well advanced, the patient loses weight and is very prone to have a chain of mental symptoms, equal to those of starvation. In addition to these subjective symptoms the analyses of stomach contents may show blood and usually do show hyperacidity both in combined and free HCl, with the other undigested contents, etc. Abdominal palpation may show a dilated stomach with marked succussion. I am not impressed by Einhorn's string method as too many errors may crop up in the production of the blood stain, both in measurement of the distance and origin of the source. Occult blood in the stools is an aid in diagnosis but ranks only as a factor when present, as it may be from any portion of the intestinal canal.

Pain in the right upper quadrant is present to the right of the midline, bordering closely upon the classical gall-bladder zone with now and then as previously stated, pain in the back.

Acute perforation of the ulcer may take place without any preceding symptoms of moment. The onset is a pain of intense character, requiring morphine in liberal quantity; shock, board-like rigidity in the upper right quadrant; thoracic breathing and later pain in the right lower quadrant simulating appendicitis. This pain is due to irritation of the peritoneum by escaping contents of the stomach and duodenum.

Operative interference in the early stages may be followed by overlooking the ulcer because of its not being calloused or indurated. It is in just this type of case that operative relief has fallen into disrepute, many patients being opened and closed with the statement that ulcer was not found. The appendix, if not removed before, is removed now, and blamed for all disturbance. The patient may

then go through one of his characteristic nonsymptomatic periods, only to begin again on time at a later period.

The *x*-ray examination in about 85 per cent. is quite definite, while in 10 to 15 per cent. it will present evidences that may be so confusing as to demand abdominal exploration. The history of the patient, carefully taken, ranks one in making the diagnosis; the *x*-ray ranks two, while chemical and physiological analyses come in as factors three and four.

Lues, with its abdominal crises, must always be considered as a confusional factor of great weight in upper abdominal disease. Pneumonia of the right lower lobe and diaphragmatic pleurisy frequently mislead us, but much more so in appendicitis than in cholecystitis.

Children and adults, with no rotation of the cecum, or with long appendices turned upward and backward will give confusional symptoms of sufficient importance to compel the surgeon to make a high incision.

Recently in a definite ulcer history, and so diagnosticated, a very markedly chronic appendix was removed from under the gall-bladder and directly over a duodenal ulcer the size of a 25-cent piece.

For renal calculus, recall that the pain is in the lumbar zone and chiefly in the costovertebral angle, although an occasional recto-cecal appendix is found, the preliminary symptoms—*i.e.*, those of onset, will in the majority of cases be of sufficient weight to aid in a proper diagnosis.

Acute hemorrhagic pancreatitis is a disease that is so acute in its onset and so overpowering in its symptomatology that frequently the patient is seen in shock or collapse. In these instances it is with great difficulty that a history is to be obtained. Nevertheless, the intensity of onset pain, the shock, collapse and a peculiar abdominal lividity all point to pancreatitis. Should the patient survive, he will tell you that he has had most severe abdominal pain and perhaps backache, that he may have had a previous mild attack, or gall-stone attack, etc. Later on his pulse improves; his temperature, from subnormal, rises 2 to 4°, and a mass may be diagnosticated in the epigastrium in thirty-six to forty-eight hours, in some patients as early as twelve to twenty-four hours. Dulness may be evidenced in the flanks, due to the outpouring of a peculiar beef broth-like fluid in the peritoneal cavity. Later pain develops in the appendicular vicinity and may give rise at this time to a mistaken diagnosis of appendicitis.

DISCUSSION.

Dr. Herman E. Hayd, of Buffalo, New York.—Dr. Erdman has shown us that perhaps the most important of all signs and symptoms of gall-bladder disease and of ulcer is the history. If men will spend more time in getting a careful history of their patients, we will make fewer mistakes. I do not believe that so many of the mistakes we make are the result so much of ignorance as of carelessness. We are too hurried.

One good point he brought out strongly that you never get acute pain in ulcer of the stomach or duodenum until that ulcer has encroached upon the peritoneal wall. Just as soon as there is a tendency to erosion of the peritoneum and possible perforation we get the acute agonizing pain which we see in cases of gall-stone colic.

Another interesting point he brought out was with reference to blood jaundice as compared with the jaundice of obstruction, whether it be from an obstructed calculus in the cystic duct, pressing upon the hepatic ducts or whether the stone gets down into the common duct or still further in the bile tube at the papilla. He stated that in the blood jaundice we do not have the picture in the urine nor do we have the picture in the bowel. I think this is very important.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I was delighted with the manner in which Dr. Erdmann gave us a digest of the symptoms and signs in these gall-bladder cases. I would like to add, that in our present acceptance of bacteremic disease, the exanthemata, etc., we are too restricted in our clinical conceptions. For example, in the matter of smallpox or any of the exanthematous diseases, we are content with knowing the eruption, in making the diagnosis, in giving routine treatment. If in these cases we would look more thoroughly for the localized effect of bacteremic disease, we would have the early symptoms pointing to these cases. Having a bacteremic disease of severity present, we will at once think of the possibility that the patient may have gall-bladder disease.

Another point I wish to take up is that these cases all have what has been designated prodromal stages. The prodromal stage may not be always clear. We have a cholecystitis that goes back to the early infectious disease, with bacteremia, and afterward we have a revival of it. Deftness of touch will so definitely outline the gall-bladder that we have reason to practise it in these cases. I rely more upon my touch than upon radiographic findings.

The capricious discarding of certain foods is a very common symptom in these cases. The patient will throw out a certain article of food in many instances, and in other cases I find the patient will reduce it to one article.

ACUTE GASTRIC DILATATION.

BY

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While surgeons frequently observe gastric dilatation as a consequence of pyloric obstruction and, less frequently, gastric myasthenia with dilatation, both conditions usually amenable to treatment either surgical or medical, they but rarely observe the type of dilatation acute in character, and often exceedingly serious in its consequences, best known among other designations as mesenteric ileus. This form, which includes both stomach and duodenum in the dilatation, carries with it a death-rate estimated by different writers as from 63 per cent. (Deaver) to 80 per cent. Any disease that shows as high a death-rate as this warrants our close attention.

So far as I know, Rokitansky in 1863 was the first to call attention to the probable true nature of this serious trouble. He believed that it is universally brought about by the constricting action of the mesenteric blood-vessels, where they cross the outer third of the duodenum, there compressing it against the vertebral column. This constricting action by the mesenteric root he conceived as occurring through the downward dragging of the intestines in certain cases of acute enteroptosis, with complete obstruction of the duodenum. A rapid dilatation of the stomach and the proximal duodenum ensues, with a rolling forward of both, inducing a volvulus at and above the point of constriction, often with fatal results in from twenty-four to forty-eight hours.

Hilton Fagge in 1872 discussed the condition; and Byron Robinson, in 1893, after numerous dissections, wrote an article endorsing the views of Rokitansky, as did also Albrect and Hanau, who in 1899 performed numerous experiments and wrote on this subject. Since then most writers admit that obstruction of the duodenum must be present to produce the acute symptoms observed; but they do not agree as to the primary causes, several of which have been brought forward, such as spasm of the pylorus, by Pepper and Stengel; volvulus of the stomach, by Weisenger; excessive secretion of the stomach, by Faag; fermentation of the stomach contents,

rapidly producing an enormous accumulation of gas, and again, the presence in the stomach contents of the gas bacillus.

In 1909 Lardenois of Rheims advanced the idea that the initial factor is the air swallowing so often observed after long chloroform anesthesia and occasioned by attempts of the patient to relieve the intense thirst, the dry tongue, and the irritated throat with collections of mucus in the mouth. The stomach thus becomes distended with air and unable to move upward or to either side because the diaphragm, the liver, the chest wall, and the abdominal wall prevent it from moving outward, especially if tightly bandaged; it is compelled, therefore, to descend into the abdomen and in doing so pushes down before it the intestinal mass. At this point, powerful traction upon the superior mesenteric artery occurs, and, as a consequence, occlusion of the duodenum.

Bloodgood believes that the pull of a distended cecum on the small intestine, when the mesentery of that portion of the ileum near the cecum is abnormally short, may and does produce constriction of the duodenum. Other causes directly bringing about acute stomach dilatation have been suggested, such as paralysis of the stomach center in the brain, owing to prolonged anesthesia. Chloroform seems to be the agent principally accused. Section of the vagus nerve above the middle dorsal root in dogs leads to acute dilatation of the stomach, it is claimed.

Linkie(1) says that without weakening of the stomach musculature, compression of the duodenum alone can never cause acute gastric dilatation, a belief not held by many observers. Ochsner attributes it to "abnormal sphincteric action of the circular muscle fibers in the duodenum."

Finney is rather skeptical as to the influence of the mesenteric root in producing either dilatation of duodenum or duodenum and stomach, for he says, "If this compression were the real cause of the trouble, it would furnish an almost ideal indication for gastroenterostomy, and relief ought to follow this operation. On the contrary, this is not the case. The usual operative methods have in my experience failed utterly to relieve the trouble."

He speaks here of chronic duodenal dilatation, but I take it that he means this observation to hold true in acute dilatation as well.

Dr. Finney ascribes the trouble to some "change in function or structure of the pancreas." A sufficient explanation of the failure of gastro-enterostomy to cure in these cases, according to the experience of Dr. Finney and others, lies in the fact that this operation does not drain the duodenum.

A duodenojejunostomy performed after the method of Jabouley should be of value, if we assume that the retained duodenal toxic content is the factor of danger, as now seems most likely. It is well known that acute dilatation is not necessarily a sequence of operative procedure, but has been observed in puerperal women, during the course of typhoid fever, tuberculosis, scarlet fever, empyemia, fright, intense pain, and notably after serious burns and fractures, and sometimes after very minor injuries. In my experience, the sudden dilatation of the stomach sometimes observed during operation when anesthesia has been prolonged is not usually of lethal significance, but may become so, I am sure, as is illustrated by a case reported later in this paper. Death following so rapidly upon the initial symptoms, in so many instances, has given rise to much inquiry and some experiment, as is usual when the reason for a matter is not fully understood; but it seems obvious that the biliary and pancreatic secretions unable to escape, are the important factors in the production of the rapidly fatal consequences. McLean, after experiments with ileus upon animals, asserts that "It is either the secretions or the altered physiological relation of the secretions of the duodenal mucosa that produce both the alarming symptoms and death." Whipple, Stone and Bernheim hold similar views.

Bonney asserts that the fatal results are due to "toxic absorption from the upper intestinal tract brought about by an ascending infection of bacillus coli communis and other organisms of the lower gut in a state of intensified virulence and activity." (Fowler, Annals of Surgery, Aug., 1917). It does not seem to me this last observation is an adequate explanation of the clinical phenomena observed.

Kelsall believes the drop in blood pressure from cerebral anemia and the loss of body fluids to be the principal factor; and Andries, Hartwell, and Hoguet take a similar view. Again it does not seem to me that clinical experience can be brought into alignment with this theory. It certainly cannot in the few cases I have observed, for in none of them was there excessive loss of body fluid; and again, stomach dilatation is not frequently observed in the many cases we meet of excessive loss of body fluids.

A. Pauchet(2) advanced the idea that the great danger is due to an acute acidosis, and recommends continuous proctoclysis with sugar and alkaline solution to supply pabulum and overcome it. His evidence for this view, however, is not sufficient; and I think we must conclude that the fatal consequences are due either to disarranged physiology of the duodenum, or, what is more likely, to retained

glandular secretion permitting of the manufacture of toxins of a possible bacterial origin.

In 1912 I reported to the Ohio State Medical Society two fatal cases of acute dilatation of the stomach following operation upon that organ, with the postmortem findings; and these cases and one since then fully bear out the conclusions that obstruction of the duodenum by the root of the mesentery and toxic influence brought about by it are the principal factors in the serious consequences of this disease. In addition to the three fatal cases mentioned, I have had one case with recovery that I think of sufficient interest to report here.

Mrs. K. D., aged thirty-three, mother of two children, entered Robinwood Hospital in Toledo, O., Oct. 25, 1916, and was operated Oct. 28th. A panhysterectomy and appendectomy were done, the hysterectomy for adenoma of the uterus and chronic inflammation of the ovaries and tubes. Just prior to operation her pulse was 76 and her temperature 97.6° F. At the end of the operation, the pulse ran up to 120 and was rather feeble.

When she returned to her room, enteroclysis was started and the patient given digitalin gr. $\frac{1}{100}$. The pulse dropped to 88, but soon after it started gradually upward again, and in a few hours it reached 150 and became very feeble. At the end of twenty-four hours thereafter the outcome seemed hopeless. Her pulse at one time was recorded as 176. The upper abdomen now showed a great distention, which was most in evidence on the left side. Vomiting was not a marked symptom, but occasionally a small quantity of clear fluid was thrown up. Almost from the first, the patient continued to be extremely restless, and large doses of morphine did not adequately control her. She continued vomiting small amounts during the second day, and the distention increased; but suddenly following the intake of a large glass of hot water, she vomited an enormous quantity of greenish fluid that filled an ordinary patent pail half full. At this time the stomach extended nearly to the pubis. Almost immediately after this ejection, the pulse came down to 128 and the distention was relieved entirely, only, however, to return rapidly. The diagnosis could no longer be in doubt. The stomach was now irrigated at brief intervals, and the patient was placed in the knee-chest position and kept there for half-hour periods. Between times she was kept lying in the ventral position with the foot of the bed greatly elevated. After another twenty-four hours the pulse began slowly to lessen in frequency and the stomach to return to its normal size; and the patient finally recovered. I have no doubt that in this case the paralyzing influence of the anesthetic, a mixture of ether and chloroform, was the determining factor in the production of the trouble, for the reason that the initial symptoms appeared in so short a time following operation; though the fact that the patient was placed in the Fowler position for pelvic

drainage immediately after operation, may have been a factor in its production.

I shall also report a case observed by Dr. Wm. H. Fisher of Toledo, O., the notes of which he has kindly permitted me to use. While it is not a case of acute dilatation of the stomach, it so bears upon the pathology of this disease that I think it of great value in illustrating another manner in which the duodenum may become occluded.

Joseph R., American, aged twenty-one, occupation, farmer. Family history negative. Personal history elicited nothing except stomach disturbances from childhood. Burning sensation in epigastrium associated with exercise. Bananas only food product that disagreed with him, producing indigestion with distention. Always a tendency to constipation followed by vomiting when it was not relieved. Never any gastric pain in early course of disease. A very significant and pathognomonic symptom developed last April. On assuming the upright position, after working in a stooping position, he was taken with an epigastric pain, radiating to back and right of abdomen. Pain was continuous, more or less severe, and compelled him to cease work. Always more severe on regaining upright position.

Condition found at operation June 19, 1918. Right rectus incision revealed a dilated duodenum. The duodenojejunal fossa was entirely obliterated by a dilated duodenum and surrounding retractive peritonitis. The jejunum, instead of passing to left and downward, was retracted upward and to right, firmly adherent to abdominal vessels and completely flattened against spine. Its course then was downward and to the right. Operative technic. The surgical consideration was to restore the bowel to its natural position. After careful dissection, the bowel was freed from its attachments and the mesentery unrolled, allowing the bowel to pass to the left. The raw surfaces were closed over, and a retaining suture was placed on the jejunum to prevent further rotation to the right.

The patient was elevated in bed and was kept on left side for three days. Convalescence uninterrupted. Discharged from hospital two weeks later. The keynote of success in the operative technic consisted of the careful dissection to relieve the double angulation, and of the proper juxtaposition of peritoneum, by which a future retraction of the bowel was avoided. Up to present time he reports himself perfectly well.

The diagnosis of these cases is not always easily made, for the symptoms are frequently confusing. Many cases of supposed peritonitis are undoubtedly acute dilatation of the stomach. The patients first complain of discomfort in the epigastrium, with a sense of distention. Attempts at vomiting are frequent, but in

my cases, at least, the amount vomited is small, and consists chiefly of gastric secretion and mucus; and in none of the cases has it been markedly offensive. In my case that recovered it became greenish in character and once enormous in quantity. With these symptoms —a rapidly rising pulse and distention of the upper abdomen most marked on left side—acute dilatation should be suspected. In none of my cases was there rise in temperature. If now a stomach tube is introduced, and a large quantity of odorless gas and fluid escapes with relief of the distention, the diagnosis may be considered established. The *x*-ray can, of course, be employed to confirm it. The treatment may be both medical and surgical; but until now, surgery employed in acute gastric dilatation has met with scant success. In their book on surgery of the upper abdomen, Deaver and Ashurst report fourteen cases that had been subjected to operation with a mortality of 85 per cent. The operations were exploratory laparotomy alone, and laparotomy with emptying of the stomach, reduction of the volvulus, jejunopexy, gastrotomy, gastrostomy and gastrojejunostomy—these operations are mentioned only to be condemned as unwarranted procedures, nor does it seem probable that any operation can be of value unless it drains the duodenum. Recently O. S. Fowler has described and employed with success(3) in instances of postoperative paralytic ileus an operation that with a little modification, should be of value in these cases. In the operation described, a loop of gut is brought up as near the duodenum as possible, in order that drainage may be obtained from "this reservoir of toxicity." It is then sutured to the skin and opened, and a drainage tube is introduced in both directions. If the patient survives, the fistula can easily be closed later.

In acute gastric dilatation, after lavage and position have been thoroughly tried without success, I would suggest, first, that the stomach be evacuated with the tube as completely as possible in order that it may be in a collapsed state and so more readily dealt with, and that the abdomen then be opened in upper median line. Deliver the stomach, transverse colon, and omentum as for a posterior gastroenterostomy; bring up a loop of jejunum as high as possible, and attach to the skin; open and introduce a tube through it directly into the duodenum, and close the abdomen about it. This procedure experimentally is practicable, and should be of value if our contention that the toxicity retained by the duodenum is the important lethal factor, proves correct. In addition to surgery, repeated evacuation of the stomach with the tube and the placing of the patients in positions to overcome gravity of the intestines, such as the knee-chest

position and the ventral position, with the foot of the bed greatly elevated are to be recommended; but reliance upon these measures alone will surely be accompanied by a high death rate.

Zade recommends that the patient be kept in the knee-chest position fifteen minutes out of every two hours; but I believe this time should be doubled. The importance of an early diagnosis and active treatment in these cases can hardly be overestimated. If diagnosis is made early enough and active treatment employed, it is very probable that many may be saved without surgical interference; but if we are to lower the present high death rate appreciably, I am sure it will be through surgery, and surgery that drains the duodenum and keeps it drained thoroughly until the stomach has had time to regain its normal tone and return to its normal position.

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DISCUSSION.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Two years ago Keith, of London, called attention to the fact that what we were calling Auerbach's plexus of nerves is really neuromuscular tissue. It is neither muscle nor nerve, but differentiated tissue that is present all the way from the cardiac end of the stomach down to the sigmoid, but in certain localities it is bundled together in nodes, one of these places being where the nerves enter around the cecum. It is this tissue which activates the stomach and causes intestinal action. We know there are two pulsating waves analogous to heart action and peristalsis. We know the interrelation between the action of the stomach and cecum. If you put a teaspoonful of hot water in the stomach the cecum will produce peristaltic action. The latter is the last part of the intestinal tract which ceases acting when exposed to the air, the carbonic acid is evacuated from it, when an inhibiting effect is produced.

In my work for a number of years on the embryonal bands, called Jackson's bands, Lane's kinks, etc., it has been my experience that they do not produce any distress to the patient unless they occur in the neighborhood of these nodes with the accumulation of neuromuscular tissue. You can get adhesions around the small intestine and have no bad effects; if you inhibit the effect of these bands in the neighborhood of the ileocecal valve, either at the terminal part of the ileum or the beginning part of the colon, you get reflex effects. I have observed in every case a dilated indolent duodenum and a generally dilated indolent pylorus. I have looked upon dilatation of the stomach as really a pathological dilatation of the duodenum. The dangerous symptoms, those which distress the

patient and need quick attention, are those with dilated duodenum. I have operated and have seen a duodenum that was normal in size and appearance, become in twenty-four hours four to six times larger in diameter throughout its entire length.

I hardly think the theories advanced in the past were the correct ones as to the cause of the extra development of the dilatation, that is, traction on the mesenteric artery, fermentation, and so on. I look upon it as regional shock to the so-called Auerbach's plexus and an atonic condition of the stomach and duodenum as a result. If you watch the pit of the stomach after every operation for dilatation; if you watch for vomiting and especially if it occurs occasionally in large amounts, you can be sure that dilatation is beginning. If you are keen and always on the watch for what may happen and wash the stomach with water at a temperature of 120°, if necessary every four hours, and stimulate the plexuses through the entire length of the system by using a Kemp's tube, you can accomplish a great deal. I find very few surgeons in hospitals know what the Kemp's tube is. It is a device with a double current for rectal irrigation with the water at a temperature of 120°. The nurse may not know how to use it correctly unless you tell her just how. There should be a hot water bag with the temperature of the water at 120°, the air expressed, folded in the bed, and a tube for irrigating passed through that, so that the water that enters the rectum should be at a temperature of 120° and allowed to run for twenty minutes. By the end of that time the entire length of the colon is flushed thoroughly. Warming the interior of the abdomen stimulates the solar plexus; it stimulates the plexus of nerves in the intestinal tract. Urine is freely secreted. Proper stimulation of the heart results. The capillaries of the skin are dilated; the skin becomes warmer, there is perspiration, and then comes, last of all, the soporific effect. These patients sleep. If you use your Kemp's tube scientifically and are watchful, if you will wash the stomach, you will never get to the terminal stage where you will feel the necessity of operating.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I agree with Dr. Gillette that it is a constriction in the duodenum that holds back the contents, and our salvation for these cases is to reëstablish drainage. As to the part played by Auerbach's plexus, that is of secondary importance. As mentioned by Dr. Gillette the folds of embryonal replication of the peritoneum are a very important factor in all these cases plus the subsequent infection by bacteremic disease in the pelvis. It is not due to operation. In these cases almost invariably you have trouble in the duodenal region before you have evidence of symptoms referable to that region, and inasmuch as my paper will deal with this phase of the subject, I will not say anything further.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—Many years ago, when I began to practice medicine and surgery I was taught that in the beginning of a peritonitis it was the transverse colon that distended. We believed in those days that the transverse colon was really transverse; that it did not hang down as low as we know it

does. I had not observed these cases very long, however, before I decided it was not the transverse colon at fault but the stomach that needed attention. The distention goes down to the small intestine and finally into the larger one.

A number of years ago when we operated on cases of obstruction of the bowel where there was a band of adhesions, we broke it up and let the bowel alone and expected our cases to get well. But they went on and died just the same as if we had not operated on them. Some surgeons taught us that we must open the intestine and wash out the poisonous contents above the seat of obstruction, not allowing any of these poisons to get into the healthy bowel where they would be absorbed, if we wish to save the lives of these patients. Also, years ago many of us tried to relieve distention of the paralyzed bowel by opening the bowel and draining it. We never succeeded. We never saved these patients because we only drained one or two coils, or the bowel prevented us from draining anything more, and our patients went on and died. That brings me to the question of acute dilatation of the stomach.

It is my belief that a great majority of these cases are due to infection. My belief is that it is an infection acting as Dr. Dickinson has said largely through the nervous system, and I thoroughly agree with the doctor that washing out of the stomach must be commenced early. It must be persisted in and fluid must be kept from the patient, I mean by the stomach. The stomach should be kept absolutely at rest, and I believe if along with these measures we exercise good judgment a great many of them will get well.

I wish to refer to one other factor which I think sometimes plays a rôle in these cases. About a year ago a young intern of the hospital with which Dr. Miller and Dr. Tate and I are connected, a big robust fellow, a very hearty and rapid eater, ate a big midnight lunch and breakfasted as usual. He also ate his noonday meal. In the afternoon he was seized with pain in the region of the appendix. One of the surgeons visited the house, saw him, and made a diagnosis of acute appendicitis. Forty-eight hours later I saw him in consultation with an acute dilatation of the stomach, and I insisted on this washing treatment. His pulse came down; his temperature got better; he improved generally, but unfortunately I had to leave town. He was again given food. The dilatation recurred and death ensued. I believe that in this particular case if that man's stomach had been washed out before he was operated on he would not have had any trouble. He was operated on with an overloaded stomach which, with altered secretions soon contained a large quantity of poison. I think all of us have learned from experience that before operating on any one with obstruction of the bowel the stomach should be washed out.

Dr. Joseph P. Runyan, Little Rock, Arkansas.—I believe we are all pretty well agreed as to what the treatment should be for this condition, but unlike one of the preceding speakers who said that the stomach should be washed every four hours by the clock, I want to say that it is my opinion that this is a condition in which we should use prophylactic treatment. This means starting early and

not by the clock, to wash out the stomach. I have seen many of these cases in which, I believe, if we had waited four hours to wash the stomach, the patient would have been in a serious condition. It is a routine in St. Luke's Hospital to begin washing out the stomach when the patient vomits twice. Our nurses have instructions never under any circumstances, no matter what operation has been performed, minor or major, to allow the patient to vomit more than twice, before beginning lavage. If you do not have some kind of rule and have a nurse wait for you to give instructions, the patient may get in a serious condition. Each time the stomach is washed a teaspoonful of bicarbonate of soda in a glassful of water is put in through the stomach tube to be retained, no matter how many times it becomes necessary to wash the stomach. This is a routine with us. The stomach is washed a second time within an hour after the first lavage and the condition found at the second washing determines what is to be the future treatment, as to how frequently the stomach will require lavage. I think it is bad practice to treat these cases by the clock or to wait until they get very sick before beginning treatment. And if you will follow the routine of washing the stomach immediately after the symptoms occur, and wash it the second time within an hour, if the stomach is full of fluid, and continue every half hour until you find it empty and until there is no dilatation, you can accomplish a great deal. We usually give at the beginning of this condition an ampoule of pituitrin, at the time of stomach washing, and in addition to that start a soda proctoclysis.

Following of this routine for the past five years has given us entire satisfaction and a death from acute dilatation of the stomach is exceedingly rare.

Dr. Gillette (closing).—I have found that patients with acute dilatation of the stomach, often die so quickly, after the condition is first recognized, that washing out the stomach does not seem to do any good. After washing and relieving the distention, it returns with the greatest rapidity, and the patient goes on to death. I have done postmortems on three cases and in all the gut at the duodenojejunal union was completely occluded. The duodenum and the stomach were shut off completely from the lower intestinal tract. I have not been able to drain the duodenum very well with a stomach tube, and do not believe it can be done efficiently with it alone. I believe the only way the duodenum can be thoroughly drained, in the presence of an acute dilatation of the stomach, is by making an anastomosis after the manner which I have suggested, or preferably, of opening the jejunum close up to the duodenum, and introducing a tube through the constriction directly into it.

Dr. John F. Erdman, New York City.—May I ask one question bearing on the relation of the duodenojejunal junction. Is it not a fact, at least it is in my service and experience, that in many jejunogastrostomies we do have postoperative dilatation that gives us a great deal of trouble?

Dr. Gillette.—There is no question but that the operation of gastrojejunostomy has been followed by, and has been the cause, in many instances of acute dilatation of the stomach.

SARCOMA OF THE LEFT OVARY IN A CHILD TWENTY-THREE MONTHS OLD.

BY

HERMAN E. HAYD, M. D., F. A. C. S.,

Buffalo, N. Y.

THE object of this paper is to present a specimen which is unusual, and has some specially interesting clinical features connected with it.

It is a small, round-cell sarcoma of the right ovary, about the size of a goose egg, which I removed from a baby twenty-three months old. The child had a temperature of 101° F., was peevish and irritable, had lost considerable flesh, had been sick about ten days, was cutting her eye teeth, and had some bronchitic sounds in the chest, and with areas of bronchopneumonia in both lungs. The liver dulness was much increased. The bowels and kidneys were functionating satisfactorily. In the lower right quadrant could be felt a large movable smooth tumor, not painful to the touch. The first point which engaged our attention was the nature of this swelling; secondly, what should be done with it under the present condition; thirdly, was it in any way responsible for the symptoms which the child was presenting? She was taking milk and liquid nourishment freely, so it seemed best in our judgment to treat the symptoms, irrespective of the abdominal condition. In the course of four or five days the temperature became normal, the child began to play, took considerable semisolid food, the tongue cleared up, the feverish condition of the mouth and lips passed away, and the mother was told to take the child into the country and to return in a few weeks or earlier, if the child's condition did not continue to improve.

Naturally, several possibilities came into our minds as to the nature of this movable mass; first and foremost, was it a chronic intussusception, an omental tuberculosis, a localized peritoneal tuberculosis, a chronic appendicitis, dermoid cyst, or a fecal impaction, etc.? The child remained at home for ten or twelve days, when Dr. Mann, under whose care she was, sent her back to me. The lungs were clear, but the abdomen contained considerable fluid, and the mass, which was still movable, was tender and the tempera-

ture was 100° F., the child looked sick and was again fretful and irritable. She was prepared immediately for an operation; was given ether, and through a central incision this tumor, which was free in the abdomen, was removed, with the right tube attached to it. The appendix was long and curled upon itself, and it was also removed. The uterus and the left tube and ovary were normal. Quite a little bloody fluid escaped when the abdomen was opened. The liver was palpated and found to be very much enlarged and filled with nodular masses. The child suffered very little shock, made an uneventful surgical recovery, and left the hospital on the thirteenth day; she finally died at the end of the fifth week, no doubt, from exhaustion with perhaps general sarcomatosis.

In looking over the literature of tumors of the ovary in the infant, the number reported is extremely few, and I find none in a child so young.

H. Wilkinson reported one in the *Kansas Medical Journal* of 1915, a bilateral sarcoma in a child five years old with a large retroperitoneal metastasis. There were no symptoms referable to the mass when he first saw the case. The child had an acute sickness with cough, which she had suffered from for two or three weeks and was run down. One week before this attack, the parents had noticed a lump in the lower part of the abdomen on the left side, movable with very little tenderness; she was sent home and in a few weeks was operated upon. The growth was the size of an egg and the child lived two months. Section showed small round-celled sarcoma.

A. Aldridge Matthews, Spokane, Washington, reported a case in *Northwestern Medicine*, November, 1916, the size of a lemon, occurring in a child two years old. He first saw her in an attack, which simulated appendicitis. It cleared up in a few days. A few months later the attending physician discovered a lump, movable, and not tender, in the lower right abdomen; operation, uneventful surgical recovery.

T. Twistington Higgins, in the June, 1915, number of the *British Journal of Diseases of Children*, reports three cases of ovarian sarcoma in children, on one of which a child five years old he operated. In the Museum of the Hospital were two other specimens, one removed successfully from a child seven years old, which weighed 5¾ pounds. He says, "these cases showed the same insidious onset with unexplained colicky pain and later the appearance of a mobile lump with possibly some precocious menstruation. The steady enlargement of the abdomen with pain and fever, the result of adhesive peritonitis occurring on the surface of the growth,

and, finally, a tendency to spread by direct extension along lines of adhesions rather than by metastasis."

Smith and Motley report in the April, 1915, number of *Surgery, Gynecology and Obstetrics*, a case of bilateral sarcoma in a child three years old, and they give a very complete record of it and the cases which have been published in the literature of the subject with a full bibliography.

Bland Sutton in his book on "Diseases of the Ovaries and Fallopian Tubes," reports sixty cases in infants and girls under fifteen, of which twenty-eight were dermoids, sixteen sarcomata and sixteen cysts. He also calls attention to the very interesting case of Doran's, in which there was a very large ovarian tumor with sarcomatous changes, removed from a fetus seven months old. He also was impressed with the frequency of malignant changes in all dermoid tumors of children and admonishes us, that one must be a good microscopist to detect these changes, because of the heterogeneous character of these tumors. He also says, "the etiology of these sarcomata is unknown and that they are histologically distinct and should be put into a group by themselves, under the term oöphoromata, because they seem to be special to the connective tissue of the oöphoron." They are frequently bilateral, and therefore in operating the other tube and ovary should be carefully examined.

I append herewith the pathologic report by Dr. Burton T. Simpson, of Buffalo.

Gross Appearance.—Tumor was oblong in shape, and about the size, and resembled very much, a normal adult kidney, measuring 17 cm. × 7 cm. × 3 cm. The tumor, soft and friable, was smooth but showed slight nodular elevations. It was pinkish in color, but there were deep red blotches, no doubt due to hemorrhagic infiltration. On the outer surface, the tumor appeared mottled, whitish gray in color, with yellow necrotic areas, also deep red areas due to hemorrhage. There was no evidence of remains of ovarian tissue, the ovary apparently being completely replaced by tumor tissue.

Microscopic Appearance.—Microscopic examination shows the tumor to be made up of rather large round cells with deeply staining vesicular nuclei and many cells showing karyokinetic figures. There was a great tendency to hemorrhagic infiltration, also to necrosis of the cells, some showing fatty degeneration. There were groups of these cells separated from each other by connective-tissue stroma, and there were numerous large spindle cells scattered in this stroma.

Dr. Hayd also exhibited specimens of very large

PUS TUBES.

This specimen was removed ten months ago. The woman was brought to me by Dr. Potter. She went to his office complaining of backache. She was twenty-six years of age, had been married three years, and was a handsome, Swedish woman, with beautiful complexion, jolly, and the picture of health. When she came into the office I said, "What is the matter?" She replied, "Nothing; I do not know why I am brought over here." The woman undressed; she lay on the table, and in examining her I was struck with the condition of her pelvic cavity which was filled up with these huge masses which were larger at the time of operation, than they are now. The soft parts were blue; the vagina and vulva congested and the breasts were large and nodular. There was no history of skipped menstruation, although there was some nausea. I believe that this might have been an intraligamentary pregnancy. The tube was really the size of a large banana and stood erect, and as you will see the uterine end was so thin that I could move it without any effort over quite a radius of territory in the abdominal cavity and I took it for a leg of the fetus. The other and bigger mass filled up the whole pelvic cavity. As there was some doubt I introduced a sound into the uterus. It went in 2½ inches. We were satisfied then there was no cornual pregnancy.

I advised the patient to be operated on, although she was not suffering. In two weeks she came back. We took her to the Homeopathic Hospital and removed these masses. The whole peritoneal cavity was studded with tubercles such as one ordinarily sees in the acute miliary type, and the deposits varied in size from a pea to a marble. The appendix was likewise covered with tubercles. There were a great many adhesions. Notwithstanding all that has been said about draining through the vagina, I happen to have had my early training with Dr. Joe Price and therefore I drain from above. Dr. Price used to put in a coffer-dam in these cases. I cannot put in coffer-dams as Dr. Price did, so that they remain in place. I put in a Mikulicz nest and into it, I slip a bandage 2½ inches in width, perhaps 2 or 3 yards of it and on the second day I pull out the bandage and on the fifth or sixth the nest and slip in a catheter, as a catheter goes in easier than a drainage tube. If necessary I wash out the cavity about the ninth or tenth day.

The question comes up, is this *per se* a tuberculous tube, or is it an old gonorrheal pus tube and on the top of it a tubercular peritonitis.

I took the specimen to a first-class pathologist who said he was inclined to think this *per se* a tuberculosis because the woman never suffered any pain. We all know that large pus tubes may exist without causing very much pain. Here is a woman, who never lost a day in her life from sickness, a well woman, performing her household duties, and suddenly is asked to undergo an operation and is confronted with these masses. It is possible for us to have acitic tubercular fluid in the abdomen. We can also have more or

less fibrinoplastic exudate with subsequent adhesions. The tubercular process is the same thing, only in one case, we get adhesive material that binds together, while in the other case it throws out fluid. It is possible in either class to have sacculations which contain either clear serum or pus, as it is quite possible for us to get a mixed infection, because we know, that these pus organisms may pass either through the circulation or directly through the bowel tissue into these sacculated areas of fluid. I am willing to take issue with Dr. Ill and believe that this case here and many others are cases of tuberculosis with mixed infection afterward.

The specimens show tubercular deposits on them. These were the biggest tubes I have ever seen in my life. The material that came out of the end of the tube was soft, like old milk and pus. It has undergone hardening, as they have been kept in formaline solution for months. An interesting thing in connection with this case is I never saw the left ovary. This long banana-shaped mass was the left tube and it moved like a leg; I could twist and turn it around in all directions. I did not look for the ovary as I intended to leave the uterus. I saw her the day before I came to Detroit. For eight months she had had a sinus, and every time when she was unwell blood came through this sinus, but she informs me that in the last two months it has healed up. She weighs 165 pounds.

DISCUSSION.

Dr. Edward J. Ill, Newark, New Jersey.—I dislike to take issue with Dr. Hayd. This is a tuberculous inflammation implanted as an old pus tube. It is interesting to note that in the experience of those who have made very exact records and who examine these cases both histologically, and bacteriologically, the percentage varies from seven to ten; in my own experience I have found these tubes to be tubercular in but 2 per cent. of the cases. I have seen much destruction of tissue in the mucous membrane of such tubes and constriction in various portion of the mass. There are some women who go through a pelvis illness or peritoneal involvement without much pain, and most women with pus tubes are able to move about and they often have very little pain. Often enough they forget entirely having had an acute attack.

It was correct to remove tubercular tubes. I think that the original site of a tubercular process should be excised, and then the secondary disease usually gets well.

Dr. Thomas B. Noble, Indianapolis, Indiana.—My experience with sarcoma of the ovary consists of four cases in children. Three of them are dead; one, a girl of sixteen, is living, she having been operated upon four years ago. Relative to this latter case, this beautiful pathologic specimen is to me unquestionably tubercular, and I would say they were tubercular from the study of that alone, regardless of the history, regardless of the physical character, esthetic or otherwise, of the patient who owns them. Gonorrheal infecting tubes, as we have them producing an exudate in the cavity to the

extent as here manifested, is associated with a perisalpingeal exudation and organization which gives us a thick rind or a much heavier coat than is seen here. Perisalpingitis exists in gonorrheal infection of the tubes to the extent that there is fixation and fusion with periadjacent substances, so that we do not get motility in the tubes or the uterus often such as we have here, and there can be no question in my own mind as to the character of the infection of these tubes exhibited. These are exquisitely beautiful tubes, but they would have looked much better to me had the uterus been suspended between them.

Tuberculosis of the Fallopian tubes does not exist always by any means as a tuberculous infection of that portion of the mucosa lining the tubes, but it extends into the uterus, and if you remove the uterus and examine it, you will find a caseous degeneration clear to the os internum, as I have seen in more than one case, so that to effect a cure you should remove the uterus along with these tubes.

Dr. Hayd.—It is not a useless uterus; she has one ovary left.

Dr. Noble.—The question is negligible whether to leave the uterus. It is right to leave the ovary, but it is questionable whether the uterus should be left. Before I would leave the uterus I would split it according to Deaver's advice and expose the endometrium to view.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Dr. Noble forgets that there are several kinds of gonorrheal pus tubes. The kind he mentioned is common, but once in a while we meet with the saxophone type of pus tube that has no adhesions; it is free and up in the pelvis or abdomen.

Dr. Bertha Van Hoosen, Chicago, Illinois.—I am very much interested in pus tubes because I spend two and possibly three mornings a week at the Cook County Hospital removing them. In fact, it is the major part of our gynecologic work there.

From experience in the last five years I believe that I can safely say that the tube that has been infected by streptococcus or tubercular bacillus always has the fimbriated end open. If there is any accumulation of fluid in a tube, it is probably produced by a gonococcus infection. I believe that the diagnosis could quite accurately be made upon the condition of the ends of the tubes.

Dr. Albert Goldspohn, Chicago, Illinois.—I regret that there is such a striking sentiment displayed for tuberculosis in connection with these tubes, as I feel satisfied it is a mistake. Tuberculosis in these parts begins usually in the tube, but it does not produce a closed tube. You may have a very extensive tubercular process from there, infiltrating the mesentery of the rectum and other parts of the intestine so that you are in great danger of making perforations into the intestine, and still the tubes will not form closed sacs. I look upon this case as too late to show the fresh characteristics of infection. A painless hydrosalpinx may develop out of a pus tube, which is an acute condition and makes suffering; and this patient was comparatively well. She did not complain of anything. It is

not consistent to assume a pus tube (an acute affair) as existing in a person that feels so well. If the contents of the tube become watery the suffering is lessened and a tubercular infection, from other sources may be implanted upon it.

Dr. Edward J. Ill, Newark, New Jersey.—May I ask Dr. Hayd in closing to tell us whether there were any symptoms in the vagina in this case, such as irritation of Skene's ducts, or sclerosis of the vulvovaginal glands?

Dr. Hayd.—I saw no urethral discharge, I saw no irritation of the openings of the Bartholin glands nor enlargement of the glands. She had no discharge and I would not have believed it possible that a woman could be, without even whites, in a condition like hers. She wore no napkin, had taken no injections and that is why I thought it was an intraligamentary pregnancy.

So far as the remarks of Dr. Van Hoosen are concerned, tubercular tubes are usually open. Septic tubes are usually shut, but all tubercular tubes may close up in time when you take the fluid out of the peritoneal cavity and give the ends a chance to agglutinate or unite to the neighboring structures. All of us have taken out fresh tubercular tubes studded with tubercular nodules and the peritoneal cavity contained much ascitic fluid, but the tube is open in these cases when we operated on the patient and whether we removed all the fluid or not, we used to think it was the entrance of air that cured the case. We believed that drainage tubes did it but this is not the position taken to-day, but rather by taking out as much fluid as possible these floating open tubes have a chance to close. Then it is also probable that some bactericidal properties are added to the fluid by reason of the introduction of the air, because its opsonic index has become so much increased. These are tubercular tubes, and I don't think they were pus tubes on which a tuberculosis was engrafted as the symptoms some time in the case would have been more active. She never complained and went to her doctor because she had backache and only saw him once.

A CASE OF ABDOMINAL PREGNANCY AT TERM.

BY

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Indianapolis, Ind.

Mrs. X is a full-blooded Scotch woman, forty-two years of age. She is married and the mother of one child, three years old. She has been a strong, healthy woman all her life. Her last monthly period ceased on the first of November, 1917.

Passing over her period, which should have been about the first of December, she early in that month introduced into her uterus a catheter for the purpose of bringing on her flow.

Beginning with the last week of December and continuing through January, she had what was first a bloody and then purulent discharge. During this time she was confined in a hospital in one of our neighboring States, and evidently was suffering from the naturally expected infection, as she says she was violently ill with fever, running as high as 104°; a great deal of lower abdominal distress with pain and tenderness, sweating, vomiting and distension and loss of weight.

The surgeon in charge at that time treated her expectantly, telling her that she was too ill for any operative interference. Her condition gradually improved, so that she was able to leave the hospital in February, and with her family shortly after moved to this city.

She says that her purulent discharge from the uterus continued and during March she consulted other physicians for its relief.

Her condition was then diagnosticated by one as pus tubes; another as fibroid; and by another as ruptured tubal pregnancy.

She came to me early in May, still having the purulent discharge from the vagina. She had recovered her general health, had gained in weight, but on occasion suffered from severe abdominal pains. These pains occurred mostly at night; were lancinating in character; were referred to the lower abdomen, sometimes in one place and sometimes in another. She had not yet had a return of her normal monthly flow. No blood had been discharged from the uterus since late in December, a week or two following introduction of the catheter. Her abdomen was distinctly enlarged, but the enlargement

was rather diffuse. No well-defined circumscribed mass could be made out by inspection or palpation. But on vaginal examination a rather unusual observation was made. A mucopurulent discharge was in evidence. The vaginal wall was hot, sodden and cyanotic. On introducing the finger, a hard, globular body was immediately encountered, just above the perineum, behind the posterior vaginal wall, pushing it forward, as seen in a rectocele, crowding the cervix so far upward that it could not be felt. Allowing the fingers to rest quietly on this body for a while, an independent movement of the same was felt and a diagnosis of a living fetal head outside the uterus was satisfactorily established.

The conditions were explained to the patient and she was placed in a hospital for rest and a few days observation. With rest, restricted diet and elimination from the bowels, the abdominal pains ceased, and she became much improved in her physical well being.

At the end of two weeks, she was allowed to go home, where we occasionally observed her until the first of August last, when she was returned to the hospital and prepared for a laparotomy. She then had the physical appearance of a woman at the full period of gestation. And as near as we could estimate this was about the time for a normal delivery. She was operated on the morning of the sixth of August, this year.

After the usual preparation, a free abdominal incision was made, extending from close to ensiform to the symphysis. Pulling aside the margins of the incision, a very unusual picture was revealed. A very large area of very thin, almost transparent, amniotic sac lay beneath the abdominal wall, through which could plainly be seen the body of the fetus in vigorous activity. The omentum and transverse colon lay covering across the upper zone of the sac to which they were very intimately adherent.

It seemed strange that the adhesions here should be so close and intimate while there were none at all between amniotic sac and the parietal peritoneum in front. It seemed that nature had everywhere utilized the viscera as a substitute for the uterine wall, but had been scrupulously careful to prevent attachment to the unstable abdominal wall in front.

An attempt was made to dissect the omentum and transverse colon from the amniotic sac, but the fusion between these substances was so close that rupture of the sac almost immediately took place. Through this rent, a beautiful, well-developed and well-nourished baby girl was delivered, crying lustily. The cord was tied and cut and attention then given to the placenta and its membranes. The

membrane was adherent to the omentum, transverse colon, coils of intestines and mesentery.

The placenta, which was very large, was attached to the mesentery of the sigmoid, the posterior aspect of the broad ligament and the floor of the pelvis. Everywhere the vessels coming to this area were enormously enlarged, many of the venous channels in the mesentery and the broad ligament being as large as a finger. The fetal head had been resting upon that portion of the placenta covering the floor of the pelvis, and when it was removed, a very sharp hemorrhage of bright arterial blood took place. This we temporarily controlled by gauze sponges until the membranes could be dissected from their previously described visceral attachments. Having freed the membranes everywhere, attention was next given to the placenta itself.

The thing of all importance now was the control of hemorrhage. It was observed that the least disturbance of this viscus from its attachment would be attended with a violent flow of blood. It was evident that rapidity of action would be needed to reduce the amount of blood to be lost. We, therefore, quickly lifted that portion of the placenta attached to the sigmoidal mesentery, together with the sigmoid itself outside of the abdomen by traction, and acutely angulated them across the margin of the abdominal wound. The hemorrhage from that portion of the placenta remaining attached to the broad ligament was controlled by direct pressure with gauze sponges. Beginning at the upper and outer margin of the placenta, which was now outside of the abdomen, we rolled it loose from its mesenteric attachments and wherever a venous sinus was encountered, clamps were successfully applied.

This procedure was continued until the placenta was entirely removed from the mesentery. Coming now to the management of that portion attached to the broad ligament, a hysterectomy was determined upon for two reasons: *first*, it would afford a better and quicker control of the hemorrhage, and, *second*, the uterus was an infected organ and therefore might militate against subsequent recovery. The ovarian vessels were quickly ligated on the left side, and the left ovary with the uterus were quickly removed by supravaginal amputation. That portion of the cervix left remaining was mopped out with gauze saturated with iodine. The round ligaments were sutured into the stump, which we were able to cover everywhere without leaving any raw surface.

Now, with sutures and ligations we substituted the clamps upon the mesentery of the sigmoid, which left the field everywhere

dry and free from raw surfaces. After tying off the appendix the abdomen was closed without any drainage.

It is worthy of note that the uterus was as large as it is following a normal delivery. In other words, it was of the same size and character as if we had been doing an ordinary Cesarean section.

This patient has made a complete and uneventful recovery. Milk came into the mother's breasts on the third day, and she has continued to nurse the baby since, which shows daily gains in weight. Child weighed 8 pounds and 6 ounces when delivered.

DISCUSSION.

Dr. William Mortimer Brown, Rochester, New York.—I regret to say I did not have as good an opportunity as Dr. Noble had, in the case I had last winter that was sent into the service after having been watched by a physician from the time conception occurred. The woman lived in the country, he had watched her because he realized after his first examination that she had a tumor in the right side of her pelvis, and he anticipated a great deal of trouble at the time of her delivery. She went on without any trouble until it came time for normal delivery and labor did not ensue. Her pregnancy continued about twenty to twenty-five days beyond the estimated time. He did not know what to do, and about the time when he became more anxious the fetal movements ceased. He sent the woman into the hospital with that history.

Vaginal examination was absolutely vague; there was nothing to be mapped out. You could hardly feel the cervix. There was just a large boggy mass throughout the whole pelvis crowding the cervix over to the left side. I could not outline the fundus of the uterus in any way.

The woman was prepared for a laparotomy in the usual manner, and the abdomen opened, but in this case there was absolutely no sac about the child. The child was entirely free within the peritoneal cavity. There were no adhesions of any kind. The placenta was attached in the pelvis low down on the right side filling most of the true pelvis. The child was dead and weighed 7 pounds and some ounces. I anticipated much trouble when I came to detach the placenta, but was able to shell it out of the pelvis with very moderate bleeding. There was not as much bleeding as from a normal placental sac within the uterus. I waited a few minutes for all bleeding to stop and, as it did not, the right ovarian vessel was clamped and tied. I put in, for twenty-four hours, a cigarette drain through the incision, pulled it out at the end of that time and closed the wound. The woman went home well from the hospital in thirteen days.

Commander William Seaman Bainbridge, New York City.—I would like to ask Dr. Noble why he used plain catgut, and if in doubt, why he did not use something else? If he tied the inferior vena cava, I would like to know the number of the catgut he used.

Dr. Noble.—I made use of No. 2 plain catgut.

Dr. James E. Davis, Detroit, Michigan.—I shall not attempt to discuss the report of these cases but I wish to express my appreciation of the work which I think has been wonderfully well done.

I want to call attention to what might be called compensatory physiology in other conditions where the body may bring about obliteration of vessels either from continuing conditions of hypertrophy or of atrophy. In the uterus, in the condition of prolonged subinvolution, we have a very marked obliteration of the blood-vessels. Then again, in the uterus, after the menopause, we have obliteration of blood-vessels owing to the atrophic changes. Here then we have compensatory physiology.

I was wondering, and I am going to ask Dr. Noble, whether in the case he cites in regard to the ligation, if the presence of the tumor was really not an advantage in securing the end results? The pressure of the tumor upon the vessel for a continued length of time may have been an important help in the establishment of the compensatory circulation so that his end results were thereby favored.

Just one remark in regard to the second case. This case I think illustrates very well the virility of the chorionic structures. It has been pointed out by a number of workers that the chorionic structures will use every means for the continuation of their own existence even at the expense of the maternal organs. It has been held by some that there is no physiological regard whatsoever for the maternal organism.

Dr. Edward J. Ill, Newark, New Jersey.—It is an important thing to know how this compensation takes place. It is a serious matter to ligate the inferior vena cava and I do not think I would want to do it except under great stress or as an error. Some of the pictures I saw which were made after ligating the vena cava, showed by injecting the veins from below, that the circulation was reëstablished in the veins anterior to the spine. That is an important thing to know, so we need not worry if we do accidently or otherwise ligate the vena cava.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—The explanation that Dr. Davis has given of the symptoms after ligation is not sufficient. Of course, I have every confidence in Dr. Noble's judgment and ability and in what he says, but in cases of sarcoma we know that the veins in the neighborhood are very much enlarged, and in the stress of operation, it occurs to me that a vein may have been mistaken for the vena cava. While I agree with the last speaker that the vena cava can be ligated and compensation can take place, it seems to me this recovery was almost too uneventful.

Commander Bainbridge asked why Dr. Noble used catgut, and I want to make a remark about that. In my opinion the hemorrhages that we have from catgut do not occur because catgut has been absorbed, but they occur because it is hard to tie tight and it therefore does not destroy the intima of the blood-vessels. We all know that if we put on a clamp and leave it for forty-eight hours

we do not have hemorrhage. If we put on a catgut ligature and remove after forty-eight hours we may have hemorrhage.

Dr. Noble (closing).—I have had but one other case of abdominal pregnancy in which I delivered the fetus, membranes and placenta out of the abdomen. The placenta had undergone coagulation necrosis into a pultaceous mass. That slipped out without hemorrhage. In this case the omentum had undergone some coagulation necrosis, so I tore the omentum off of its attachment entirely, but it underwent some degenerative change, the fetus dying. This woman noticed the death of her fetus six or eight weeks previously and she got well.

I appreciate what Dr. Bonifield has said regarding this first case and his feeling in the matter. I appreciate how men do get into a mess sometimes and under the stress of circumstances make hasty judgment and apply hasty forms of therapy sometimes and right there they get into difficulty over it. We were not in that frame of mind with that woman. We had stopped the hemorrhage and removed the growth, and there was a large venous channel in the place where the vena cava ought to be and it bled like a vena cava would do.

THE RÔLE OF CONGENITAL COLONIC MEMBRANES AS A CAUSATIVE FACTOR IN DISEASE.

BY

J. P. RUNYAN, M. D.,

Little Rock, Ark.

We owe Sir Arbuthnot Lane a deep debt of gratitude for his contribution to the literature of intestinal stasis. We are equally indebted to Dr. Jabez N. Jackson for his contribution to the subject of membranous pericolitis. There is a relation between the two which we shall observe later.

But for the enthusiastic and emphatic manner in which Lane directed the attention of the medical profession to the importance of intestinal stasis as a causative factor in disease, I doubt if we should yet be alive to its significance. There is hardly any question in the mind of any of us, but that one of the cardinal symptoms among the many symptoms to be met in the treatment of diseases peculiar to the female sex, is obstinate constipation. Ever since I began the study of medicine, I have heard this subject discussed without much new light on it until Lane began to do colectomy for its relief.

Colectomy is a radical operation for the relief of intestinal stasis, and in the skilled hands of Lane, may be fairly safe, but it has always appeared to me unjustifiable, provided a simpler and safer operation could be devised.

A discussion of this subject, in the form of a symposium, read before the clinical congress in Philadelphia, convinced me that the consensus of opinion of American surgeons was opposed to colectomy as a routine for intestinal stasis. No matter what we may think of the advisability or unadvisability of doing colectomy for its relief, we are doubtless agreed that intestinal stasis is a menace to good health, and that we should endeavor to ascertain the underlying cause, and if possible, correct it.

If our premises as to the etiology of intestinal stasis be well founded, there will be different degrees of this condition in different individuals, which, as a matter of fact, we find to be the case.

Some patients suffer to such a slight degree that it is questionable as to whether they should be subjected to operation, while others are so miserable that even colectomy, with its high mortality,

might be preferable if we did not have just as effective treatment without its dangers to offer. Moreover, there is another phase of intestinal stasis for which I may be pardoned if I emphasize it. If not corrected, not only a general fecalemia occurs, but colon bacillus infections in various organs sometimes manifest themselves. In this class of patients, we see great numbers of cases of cystitis in which the microscope reveals colon bacillus as the exciting cause.

Time after time, we have seen such cases promptly clear up following an operation for the relief of intestinal stasis without any special treatment directed to the local condition. Essential hematuria, the etiology of which has been veiled in mystery, likewise clears up, following removol of the colonic membrane, which allows the big bowel to act in a normal way, normal peristalsis developing, thereby overcoming the intestinal stasis, which may have existed since childhood.

In order that we may study the underlying principle of what I conceive to be the cause of nearly all cases of intestinal stasis, and which forms the basis for the surgical procedure intended for the relief of the condition, I wish to refresh your memory on the embryology of the big bowel.

There are two fixed points in the rotation around the superior mesenteric artery of the large bowel during development; namely, the splenic flexure and the hepatic flexure, the splenic flexure being formed first, the hepatic flexure soon thereafter.

The descent of the cecum during the fourth fetal month, to the right iliac fossa, leaves the colon attached at that point. It is during this descent, most likely the formation of the bands occurs.

The cecum in its descent is rotated externally. A fusion attachment betwen the visceral and parietal layers occurs, thereby fixing the bowel to the posterior abdominal wall. The mesocolon becomes obliterated and forms above the anterior layer of the renal fascia.

The same condition obtains on the left side. But that this does not always occur, is evidenced by the fact that we find, upon opening the abdomen during operation, or on the cadaver, true mesocolons of some degree exist in about 25 per cent. of all individuals. It is found more frequently on the right side than on the left. This mesocolon becomes separated from the mesentery of the small bowel by the lateral growth of the body-wall and by the drawing in of the posterior mesogastrium when it pouches forward to form the lesser omental bursa. This produces the angular fold of peritoneum often seen connecting the cecum and small bowel.

In the incomplete fusion of the layers, there persists the indefinite

membrane which holds the cecum and ascending colon and, if strong enough, will support the colon and cecum until developmental changes occur. If not, it will begin to be taxed more and more from the time the lower abdomen commences to expand, which usually is about the twelfth year.

As the duties and activities of the child increase, angulation of the bowel becomes more marked and intestinal stasis occurs, resulting in symptoms characteristic of the condition.

The membrane connecting the cortical vessel of the kidney with those of the cecum and ascending colon favors absorption of poisonous products from the bowel, and quite frequently appears to be the predisposing cause of renal disease.

Acting upon the hypothesis that intestinal stasis is due to colonic membrane formation the result of imperfect embryological development, which membrane causes more or less angulation of the bowel, we began dividing or removing this membrane, after the manner of Jabez N. Jackson, with most gratifying results.

We submit this procedure as a splendid, safe, and sane substitute for colectomy in the treatment of intestinal stasis, and an operation devoid of mortality and most satisfactory in its results.

DISCUSSION.

Commander William Seaman Bainbridge, New York City.—The essayist has ably emphasized a number of important points in relation to this far-reaching subject. However, there are one or two misstatements, which I think are unfortunate if allowed to go uncorrected.

It has been my privilege during the last eighteen years to be in close touch with the work of Sir Arbuthnot Lane. During eleven summers, I have made trips to his clinics in London, and had an opportunity not only to see his work, but to work with and assist him at various times.

Lane's views are often misunderstood and his position misinterpreted. Constipation is not stasis. Stasis is not constipation. Stasis is a condition and constipation is a symptom. Colectomy is done by Lane for extreme cases of stasis, and not simply for constipation. Constipation is a symptom just as diarrhea is a symptom. The worst kind of stasis cases are those, very often, in which they are accompanied by diarrheas. We know perfectly well that there may be overflow with an enlarged prostate. There is frequency of micturition, but that does not mean the bladder is emptied. The frequency of the stools does not mean that the putrifying and noxious material is not there. Part of the intestinal content may be retained in any part of the tract, and we have absorption which will do damage, while apparently the bowel is emptying itself.

There is overflow of retention in the bowel, just as there is overflow of retention in the bladder. This is what Lane has frequently emphasized.

Let me briefly state the general viewpoint of those of us who have been particularly interested in this field of work.

Lane has applied the term "chronic intestinal stasis" to the condition of a persistent retention or retardation of the contents in some part of the intestinal canal, which occurs at certain points of predilection, one of these being in the appendix region. This is not the commonly known condition of sluggishness in the lower bowel designated as constipation, for stasis is often accompanied with the opposite of constipation, namely diarrhea. When chronic intestinal stasis occurs, intestinal putrefaction ensues, autointoxication follows, and in the wake of these comes a long train of physical and mental ills, too lengthy to be recounted here. The immediate symptoms, quite naturally, vary with the duration and the intensity of the stasis. Common among them are headache, general malaise, localized pain and tenderness in the abdomen, backache, drowsiness, inability to fix the attention, brown staining of the skin, a lumpy condition of the breasts in females, melancholia, and so on, leading up to absolute mental and physical disability.

According to Lane, this stasis is a fundamental factor in the causation of many diseases.

And so we have here a sort of house-that-Jack-built state of affairs, one ailment growing out of another, this in turn, giving rise to another, and so on, until we get back, no matter which way we turn, to the foundation of all—defective bodily drainage, with the alimentary tract playing the rôle of main conduit.

When intestinal stasis is present, with its concomitants, intestinal putrefaction and autointoxication, it is plain that the drainage canal is not being thoroughly cleared of its contents; that efficient plumbing is called for, and that Nature, the greatest of all plumbers, must be assisted, or the results of interference with her work overcome by whatever radical plumbing measures may be indicated.

Sometimes—in fact, in the vast majority of cases—it is possible to reinaugurate normal drainage by dietetic, hygienic, and medicinal measures. When the intestinal stasis is of mild degree and of short duration, it is quite possible to overcome it entirely by such conservative means. It is not, therefore, always to be considered as coming within the category of a surgical affection, to be treated only by operative interference. If, however, though neglect or improper treatment, the individual case is no longer amenable to preventive measures, or to the milder methods of treatment which come within the province of the family physician or the specialist in diseases of the alimentary tract, then the surgeon must be consulted. In many instances conservative surgical procedures will answer. These may consist of cutting bands which have formed about certain portions of the intestine, causing kinks in its walls, and obstruction to the flow of its contents. Sometimes the appendix, through inflammation or other causes, may "hitch up" a contiguous

loop of the intestine in such way that it does not drain properly, thus leading to a condition of stasis in this part of the drainage system. Removal of the appendix and straightening out the canal in such cases may restore proper drainage. And so, according to the condition found on opening the abdomen, milder surgical measures may overcome all the difficulty.

Unfortunately, however, some cases have advanced too far for such conservative treatment before relief is definitely sought. In such cases it may be necessary to resort to the more radical procedures for overcoming the long-continued interference with drainage and the resulting pronounced and persistent intestinal stasis. Here it may be necessary to "short-circuit" the drainage system, by what is known as ileocolostomy—the joining of one portion of the canal to another in such way as to give a "short-cut" to the onflow of the contents of the bowel. In other cases it is necessary to remove a part of the large bowel by the operation known as colectomy.

The sequency of therapeutic intervention to be borne in mind, then, in connection with chronic intestinal stasis, is: 1. Prevention; 2. Medical, dietetic and hygienic treatment; 3. Conservative surgery; 4. Radical surgery; 5. Postoperative care to prevent recurrence.

This practically emphasizes the situation as it is to-day.

Dr. James E. Davis, Detroit, Michigan.—The body in its development usually follows the law that function determines anatomic form. In many cases where we have but a slight arrest in the embryonic development, no interference with normal function occurs. We have seen instances of that over and over again. If we study a large series of cases, we will be impressed with the fact that the functions of the bowel may be performed very well, probably normally, or apparently normally, in a great number of cases notwithstanding deviated forms and positions. Why this is so, it would be impossible for us to determine in every instance; but there are a certain number of cases where the arrested anatomic form does interfere definitely, and of that we are all convinced.

Within the past year I had the opportunity of doing an autopsy which I think illustrates this very well. A child of six weeks died apparently of symptoms of inanition. The autopsy findings revealed the following very interesting condition; the right lobe of the liver appeared displaced well down into the pelvis; in fact it proved to be maldevelopment and a displacement. The gall-bladder was exactly in the right-angle position with the mid-axis of the body; the lower border of the right lobe of the liver was down in the lowermost part of the pelvis. Through the right inguinal ring the cecum and appendix were herniated. The child gave a symptomatology something like this: For the first four days after birth there was no trouble whatsoever; then there began a train of gastrointestinal disturbances, and a little later metabolic disturbance, the terminal picture was that of ordinary inanition. In my judgment, this abnormality of position was the etiological factor of the gastrointestinal and metabolic disturbances.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I am pleased to see that we are becoming more and more harmonious in our views pertaining to this subject.

Dr. Runyan (closing).—Dr. Bainbridge quotes Lane as saying that some of the worst cases of stasis have been those in which diarrhea manifested itself. Diarrhea is often the result of constipation or stasis. One may have constipation without stasis but one seldom has stasis without constipation. Moreover one may have a stool a day and yet have enough absorption of retained toxic material to thoroughly poison the system.

Whether we call it stasis or constipation does not matter. If there is retention of toxic material its absorption causes symptoms. A diarrhea in such cases is Nature's method of elimination of the poison.

Another thing to be remembered: A failure to divide the membrane at any point may result in failure to effect a cure. We find the membrane on the left side as well as on the right in a large percentage of our cases.

We always follow operation in these cases by a bicarbonate of soda proctoclysis.

REPORT OF A CASE OF PANCREATIC CYST IN ASSOCIATION WITH TUBERCULAR KIDNEY AND INTESTINAL COMPLICATIONS.

BY

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Poughkeepsie, N. Y.

Miss M. H., aged thirty-nine. Referred by Dr. Bolton, of Beacon, N. Y.

The patient was first seen at her home on June 24, 1917. She was suffering from what seemed to be at that time a very definite acute intestinal obstruction, the symptoms all being classical and the diagnosis seemed unquestioned. The obstruction, which was of twenty-four hours' duration, had come on suddenly and was evidently very extreme.

Inasmuch as two years previously she had undergone a laparotomy at which time the uterus and adnexa, as well as the appendix, had been removed, it was considered that the obstruction was due to adhesions which had developed.

This patient had also been under the care of a surgeon for a general enteroptosis, yet prior to twenty-four hours before the onset of the intestinal obstruction she had considered herself in excellent health. There had been no abdominal symptoms which could not be relieved by the wearing of an abdominal bandage. Neither had there been any symptoms referable to the kidneys and apparently her metabolism was good.

Upon June 25th, the abdominal symptoms suddenly ceased. The patient had a large evacuation of fecal matter and gas from the bowels. The abdominal distention subsided and the intestinal obstruction condition was apparently at an end. Upon the day of this fortunate result I saw the patient again and noted that while the abdominal condition had completely subsided, there was an evident mass in the region of the left kidney.

For the purpose of careful observation, the patient was removed to my hospital. A close study was made of her case, lasting through many days, including a cystoscopic examination, ureteral catheterization, etc., all of which helped to determine the fact that she had a tubercular left kidney. The strange thing about the matter though was the fact that prior to the onset of the attack of abdominal obstruction of June 24th, there had been apparently no urinary symptoms. Neither were there any symptoms which would have led one to suspect such condition of the kidney except the mass in the region of the left kidney and a slight increase in temperature.

It was demonstrated by ureteral catheterization that the right kidney was perfectly healthy.

On July 2, 1917, the left kidney was removed by operation. The operation was made extremely difficult by reason of the fact that the tubercular process in the kidney had ruptured through its capsule and a perinephritis, tubercular in character, was much in evidence. The fat about the kidney was infiltrated with pus, there were many adhesions, and the nephrectomy was most difficult to perform.

During the course of the operation—and by reason of the difficulties encountered in removing this very large and much infected and adherent kidney—it is possible that the descending colon was injured. For a few days subsequent to the operation a fecal fistula became established through the kidney wound, or it is possible that a gauze tamponade used for controlling the persistent hemorrhage in the wound, may have been a causative factor in producing this fecal fistula.

The patient rallied nicely from the operation and, in spite of the fecal discharge, she improved to a certain degree, although not to the point we desired.

She was discharged from the hospital on August 18, 1917, with the fecal fistula still in evidence and requiring the attention of a nurse. Prior to discharge there was noted a small tumor above the umbilicus and distinctly to the left of the median line, reaching over in the neighborhood of the splenic flexure of the colon. We were suspicious that this had something to do with the colon, and that it represented a tubercular process in and adjacent to the fistulous opening in the colon. We were not in the least suspicious at the onset of the real cause of the trouble.

At the time of the patient's discharge it was agreed upon that she should return to the hospital in the fall and have the fecal fistula closed—if in the meantime it did not close spontaneously.

The pathological report of the removed specimen confirmed absolutely the diagnosis of tubercular kidney and surrounding tissues.

After returning to her home there was no apparent diminution in the amount of fecal discharge.

The patient remained invalided, not so much by reason of the fistulous condition as by a somewhat apparent error in metabolism, for she neither gained in weight nor strength and was decidedly anemic as demonstrated by an examination of her blood.

She returned to the hospital on November 3, 1917, in scarcely better condition than when she left, and with the fecal fistula still quite in evidence. At this time it was noticed that the tumor in the left upper quadrant was decidedly larger, easily palpated, and could readily be seen, bulging upward that portion of the abdomen. Our first suspicion of its exact nature was obtained by distending the stomach with gas, when it was noted that the mass seemed to lie above the stomach, as is frequently the location of pancreatic cyst. Yet, considering that this patient had a left tubercular kidney, with involvement of the surrounding tissues, for which a

nephrectomy had been required and as a result of this operation she had a fecal fistula, we could not help but feel that there was an association between the original tubercular infection, the fecal fistula and the present tumor. Therefore, the second operation, performed on November 7, 1917, was undertaken *without* any definite understanding as to the nature of the tumor in the upper left quadrant of the abdomen, but simply with the prearranged intention of suturing, from the inside of the abdomen, the opening in the colon—which was responsible for the fecal fistula—as well as determining the nature of the aforesaid tumor.

An upper left rectus incision was made. Upon exposing the viscera, we were astounded to find that we had an attachment of the ileum to about the center of the transverse colon, which, when liberated, disclosed to us the fact that there was a fecal communication between this loop of the ileum and the transverse colon.

It now became apparent to us why this patient had the symptoms of acute intestinal obstruction, as was the case when I saw her first on June 24th. Evidently, at that time, there had been an acute obstruction at that point and the next day a liberation by reason of necrosis and fistulous development between the ileum and the transverse colon.

The opening in both ileum and colon was sutured. We then dissected free from the abdominal parietes the descending colon at the point of fistula. We found it perfectly healthy and sutured the opening in the colon, thereby doing away with the fistula into the former kidney wound.

We then turned our attention to the globular tumor mass in the upper abdomen, lying above the stomach and bulging the gastrohepatic omentum upward. The mass proved to be a pancreatic cyst, about the size of a large grape fruit. It had a good-sized base, and after careful palpation of its outline and attachments, we deemed it impossible to do otherwise than to drain it. So after a careful suture of the pancreatic cyst wall to the parietal peritoneum the cyst was aspirated and incised, liberating about a pint of light straw-colored fluid, which upon chemical analysis proved to be pancreatic fluid.

The cavity of the tumor was packed with gauze. Rubber tissue drains, arranged to come out of the lower end of the wound, were applied in the abdomen to the location of the intestinal suture. The patient rallied nicely from the operation, but for about two weeks there was a very extensive drainage from the cyst which was very excoriating to the surrounding surface. The drainage gradually lessened, and finally, as the wound healed, it ceased altogether. The patient's condition steadily improved and at the present time all evidence of defective metabolism is absent. She has gained in weight very materially and is now strong and vigorous.

My object in reporting this case is largely for the purpose of demonstrating the number of varied and serious conditions that may exist in one who had considered herself in good health. It is

true, that pancreatic cysts are rare—this being the very first one it has been my privilege to see—but in this case we have a patient:

1. With acute intestinal obstructive symptoms, which, unquestionably, resulted in a natural anastomosis between the ileum and the transverse colon, thereby overcoming the obstructive symptoms.

2. We have a condition of tubercular nephritis, with extensive perinephritic infection—operation for which resulted in her recovery from the tubercular condition—and also the unfortunate establishment of a colonic fistula in the lumbar region.

3. We made the discovery of the pancreatic cyst—a complex condition which required a great deal of careful thought, study and work, in order, finally, to bring the patient to her present condition of good health.

DISCUSSION.

Dr. William M. Brown, Rochester, New York.—I would like to ask Dr. Sadlier what the relation of this pancreatic cyst was to the previous obstruction, the length of time of the cyst to the obstruction?

Dr. Sadlier.—So far as this pancreatic cyst and the relation of time to the obstruction is concerned, I cannot say. I saw the patient June 24th when she had obstructive symptoms, but they did not have anything to do with the pancreatic cyst, but with the other condition. The pancreatic cyst was found with the subsequent treatment of the case.

Dr. Albert Goldspohn, Chicago, Illinois.—I would like to ask Dr. Sadlier how long he left the packing in the cyst before he removed it from the bottom; and how firm a packing did he place there?

My object in asking this question is because I have had an identical case of pancreatic cyst that was not removable. After dissecting out all the mucous lining as far as I dared to, I packed the bottom very solidly with gauze and left that in at least two weeks, with the idea of the gauze becoming a foreign body which creates reaction and will invite the formation of a granulation tissue surface in place of the mucous membrane; the mucous membrane being annihilated by the presence of the foreign body. That is the way I have treated such cases successfully.

Dr. Sadlier.—I packed the cyst tightly and removed the packing at the end of about one week.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—Prolonged experience makes us very much wiser in pursuing and investigating these cases. I have followed all these patients, and is it not possible that the cyst formation was of recent origin in this case reported by Dr. Sadlier? Was it possibly produced by the traction upon the head and body of the pancreas? The pancreatic duct may have been angulated in some way, and in that manner you have a condi-

tion very much like a large urinary bladder that dribbles away all the time. There may be dribbling into the pancreas and then you see pancreatic fluid definitely. So it is not a cyst in the ordinary sense in which you have to deal with. There was undoubtedly angulation that gave rise to pouching posteriorly, and the drainage at first would be of the same pancreatic character and afterward there was no longer an outlet for the fluid on account of the angulation of the duct.

THE RADICAL TREATMENT OF CANCER OF THE CERVIX BY IGNIEXTIRPATION (WERDER OPERATION).

BY

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PANHYSTERECTOMY for the radical removal and cure of cancer of the cervix will be the method of choice until some other method has been discovered. Radium, *x*-ray, and other methods of treatment, while valuable adjuncts to surgery, have not yet solved the problem; meanwhile, we are justified in directing our endeavors toward improving our present operative results. The extended pan-hysterectomy as popularized by Wertheim and modified to some extent by others has come to be regarded the classical type of operation in the radical removal of cervical cancer. In this connection it is only fair to call attention to the fact that the operation popularly known as the Wertheim operation was performed by X. O. Werder of Pittsburgh, two years previous to Wertheim's first publication on the subject. Although Wertheim in a private communication admitted Werder's priority in the operation, yet he has never publicly acknowledged the fact. Werder's article appeared in the AMERICAN JOURNAL OF OBSTETRICS in March, 1898, entitled "A New Operation for the Radical Treatment of Cancer of the Uterus, Consisting of the Removal of the Uterus and Vagina en Masse by the Suprapubic Method." Wertheim described practically the same operation two years later in the "*Archiv für Gynäkologie.*"

While this procedure is generally acknowledged to be the most extensive operation for cancer of the cervix, the immediate mortality is so high, and the technical difficulties are so great that only the surgeon with the widest gynecological experience is justified in undertaking the operation. Peterson has stated the matter clearly when he said that every one who has performed the operation realizes how easy it is to dodge the issue and perform what Clark has well called "makeshift" operations. Thus choosing the easiest way may save the operator a primary death, but it just as surely dooms the patient to a continuance of the disease and ultimate death as

did the old vaginal hysterectomy. Such a hysterectomy is not an extended or radical operation for cancer and should not be classed as such. If it is, it will show in the final summing up, for, if the patients are kept under observation, it will be found that they died of so-called recurrences which in reality were no recurrences at all since the disease was not removed; therefore such operations should be tabulated as incomplete or abandoned, because of the great and extensive invasion of the disease.

A review of the literature, and a careful analysis of personal experience with the Wertheim operation, prompts the conclusion that while it is an admirable procedure and has saved many lives, yet it is by no means the ideal operation. Among some of the unsatisfactory features of this operation, even in expert hands, are high primary mortality, infection, hemorrhage and prolonged operation with resulting shock, and more particularly, early recurrence. To meet these difficulties and objections, Werder abandoned his radical operation of 1898, and in 1904, he revived the use of the cautery and electrothermic clamp. While claiming nothing original, and giving full credit to Byrne, Skene, Downes, and other pioneers, he applied their suggestions and methods in a different manner and later devised the operation which he designates as the igni-extirpation or radical cautery operation for cancer of the cervix. At the Third Clinical Congress of Surgeons in New York in 1912, he described his technic and results in detail(1). The superior advantages of employing heat in treatment of cervical cancer has been repeatedly brought to our attention in this country by Byrne, Percy, Bolt, Dickinson, and Werder, and while the views expressed by these authors are not always in accord, most of them agree that far better results are obtained by the employment of heat in treating cervical cancer than by any other operative method.

The results obtained by Werder in this procedure during a period of twelve years have been analyzed by him(2) showing eighty-seven cases operated, with five deaths, or a mortality of 5.7 per cent. In fifty-nine cases the operation dates back five years or longer; of these twenty-seven have survived the five-year period, or 45.76 per cent. The writer has performed the same operation thirty-four times with two deaths, or a mortality of 5.9 per cent. Grouping both series (as practically the same technic was followed) there are 121 cases with an operative mortality of 5.8 per cent. Jacobson's (3) analysis of the Wertheim operation shows Wertheim's own operative mortality of 16.6 per cent. and 53.3 per cent. of the 5-year cure. Available statistics of ten different American operators, using the

Wertheim technic, show a total of 566 operations with a primary mortality of 23.11 per cent., and a mortality of the 5-year cure of 25.44 per cent.

Sampson(4) who employed a modified Wertheim operation in forty cases, has an operative mortality of 15.5 per cent. and Peterson, in a careful analysis of his own results, reports a mortality of 29 per cent. While these figures are significant and are decidedly in favor of the Werder procedure, actual figures mean very little without an intimate knowledge of the cases analyzed. So many factors determine operability that it would be manifestly unfair to make mortality or even morbidity the index of what constitutes the best operation for cervical cancer. It is well known that squamous-cell carcinoma is a far more favorable type than cylindrical types. The difference is so great that some authorities do not hesitate to state that carcinoma of the canal is practically certain to recur regardless of the type of operation performed. The age of the patient is likewise an important factor. It is universally admitted that cervical cancer in a young woman is far more rapid in its development, and more prone to recur, than in a patient who has passed the menopause. The clinical diagnosis is a comparatively easy matter in most cases when the patient seeks relief but for statistical purposes, every diagnosis should be verified by a complete microscopical examination before it is so tabulated.

In performing the extended panhysterectomy by the ordinary method, it has been frequently observed that recurrences appeared at the site of the vaginal scar notwithstanding the fact that wide dissection had been made and an apparently healthy zone of tissue removed with the growth. Such recurrences were doubtless due either to incomplete removal or to direct implantation, just as remote occurrences are attributable to extension through vascular and lymph channels. This observation demonstrates the fact that it is a practical impossibility to prevent autogenous implantation when removing cancerous tissue in the usual operative manner. In order to avoid engrafting cancer cells on the healthy surrounding tissues the substitution of the cautery for the knife and scissors has been of the greatest value. The slow careful application of the cautery knife, either the Downes or Percy pattern, in the preliminary dissection and circumcision of the vagina beyond the cancer zone has given the greatest satisfaction. In some of the so-called border-line cases where complete cautery removal was done and where it was later discovered that the disease had involved the lymphatic system with remote metastasis, recurrence did not appear in the vaginal

wound, and at the postmortem it was free from any evidence of cancer, thus demonstrating the value of the cautery in preventing local recurrence by its destructive and inhibiting effect on the cancer areas.

Dissemination of cancer and recurrences are favored by trauma or irritation inflicted either by the knife, curet, or by direct manipulation on the cancerous growth. It is, therefore, considered by some authorities questionable surgery to perform the time-honored diagnostic cureting or even to remove a piece of suspected tissue with a knife for microscopical examination without being prepared to proceed at once with radical removal if the diagnosis is positive. The excision for diagnosis can be easily and painlessly done with the cautery and the likelihood of the dissemination of the cancer cells is obviated. It must be admitted that a section removed by a cautery may be distorted somewhat by the heat and, therefore, may not be so satisfactory for microscopical study. For this reason it is more advisable to excise a section with a knife and then cauterize the denuded area. Too much emphasis cannot be made on the importance of avoiding manipulation of the cancerous growth either before or during operation.

Vascularity in carcinomatous areas is always pronounced and hemostasis in the radical operation is of vital importance. A comparison of a series of cases by the Wertheim technic and an equal number of the cautery technic is so much in favor of the latter method that its advantages must appeal to any surgeon. Not only capillary bleeding but large vaginal and pelvic vessels, such as the uterine, are easily controlled by the cautery. As has been pointed out repeatedly by Percy, Byrne, and others, hemostasis is obtained only by applying the cautery at a dull red heat, as high degrees of heat will frequently result in only temporary hemostasis, and repeated bleeding may occur.

In the abdominal portion of the operation, the substitution of Downes' electrothermic angiotribe for the ligature and knife is a most important part of the Werder technic. Not only are all the large vessels controlled, but the ordinary bleeding is reduced to a minimum. Implantation of cancer by the cutting needle is avoided, and the rich lymph channels of the parametrium are most effectively sealed by the heated clamps. The absence of bleeding is a great factor in the prevention of shock, a complication which is quite common in other types of radical operation. In our entire series of 121 radical cases, shock of severe or moderate type was present only in six cases, and these were border-line or advanced

cases where the invasion of the disease rendered the operation technically difficult.

Sepsis has always been a dominating factor in the abdominal route of treating cervical cancer, but by igni-extirpation we have been able to reduce infection to a minimum. In a review of the cases of uterine cancer operated at the Mayo clinic, Balfour(5) states "that in considering cancer in any other part of the body, secondary infection is an important factor in the spread of the disease, and consequently in the immediate and end results of the operation. Malignant disease of the cervix is a good example of this septic type of cancer. The infection as shown by Rosenow is usually streptococcic, and any surgical measure which does not at the same time sterilize the growth and the surrounding tissue is open to serious objection. A study of the results following the older types of operation for cancer in any septic situation shows a high relative mortality from the disease, depending as much on the degree of infection as on any other factor, and herein lies the justification for the clinical belief in the use of the actual cautery." In our earlier series, vaginal drainage was always instituted as a prophylactic measure against infection, but in our later series, drainage has been dispensed with, except for some special reason. It has been noted by other operators that pelvic gauze drainage has been the cause of later ureteral leakage and, therefore, its use should be avoided if possible. However, if the ureter has been knowingly damaged during the operation and satisfactory repair uncertain, it is deemed wise to provide egress for possible leakage, by means of a rubber tube or tissue drain, into the vagina, otherwise the abdominal leakage may result fatally.

The technic of the operation as described by Werder in his original paper has been adhered to by him and the writer with only a few modifications in the 121 cases reported. In six other cases where the clinical picture strongly suggested cancer, the radical procedure was performed, but as subsequent laboratory findings were non-malignant they have not been included in the report. In patients with unusually fat abdominal walls, or handicapped otherwise, and in whom abdominal section with prolonged peritoneal exposure would be a more serious factor, the extirpation has been done entirely through the vagina; but, wherever possible, the vagino-abdominal route is our choice.

The first step, or vaginal portion of the combined operation, has been modified to some extent in recent years. As has been stated, the cancer mass proper should be manipulated as little as possible and, therefore, the preliminary curetment of the necrotic cancer

has been dispensed with. In order to bring the cancerous cervix down as far as the fixation permits, an expanding double tenaculum forceps is introduced as far as possible into the canal of the cervix and constant traction is made. Care must be observed to avoid damaging the bladder, and for this reason, a sound is carefully introduced into that organ and its lower attachment to the cervix carefully determined and verified during the subsequent procedure. By means of the Downes' cautery knife or Percy flat blade heated to a dull cherry red, the cervix is circumcised as far out from the cancer area as possible, care being taken to protect the labia and bladder from the heated instruments by the judicious use of retractors. Attempts to hasten the amputation of the cervix by applying the cautery knife at a bright red heat will result in bleeding and thus defeat one of the principal objects of the operation. The question whether high or low degrees of heat are to be preferred in destroying cancer cells is a disputed point in some quarters(6), but our own experience is that the low degree of heat, while longer in application, is far more satisfactory. After completely separating a wide vaginal cuff with the cautery knife, the dissection of the bladder is continued with gauze wrapped about the finger. A high amputation of the cervix is performed with the cautery at a very low heat. The cancerous cervix is thus removed bloodlessly and with no likelihood of cancer implantation. Frequently, the uterine arteries are encountered, but rarely require ligating if low heat is employed. It has been found advantageous in many cases to enter the peritoneal cavity anteriorly and posteriorly to render the subsequent abdominal portion of the operation easy. The sound or catheter is again introduced into the bladder to ascertain its condition.

The patient is then placed in the Trendelenburg position and, after the usual abdominal preparation, a long median incision from umbilicus to the pubes is made. Exploration of the upper and lower abdomen is always advisable in order to determine the condition of the other viscera and at the same time to search for possible metastases. As the vaginal amputation of the cancerous area removes the danger of infection from that tract, no extensive or unusual protection of the peritoneum and intestines is indicated other than as in the ordinary abdominal section.

Careful palpation of the perimetric tissues and glands is made before proceeding with the operation. Mere thickening of the tissues and even glandular enlargement may be simply inflammatory, hence good surgical judgment must be exercised at this time

before the patient is abandoned to the fate of a simple hysterectomy. If the case is of the border-line type, and if the patient is a good or even a fair surgical risk, it is our belief that complete extirpation should be done. The attending risk, while sometimes great, seems justified in view of the fact that the patient is otherwise doomed. Fixation and thickening of the parametria due to cancerous invasion can usually be determined before the abdomen is opened, and if the disease seems too far advanced for radical removal, high cautery amputation as described, or thorough cauterization of the cancerous area is done with little or no risk. Occasionally we are surprised, on examining the patient a few days after amputation or even cauterization, to find the tissues of the parametria apparently free, so that the second or abdominal step of the operation is justified. In spite of the optimistic position that Percy has taken in regard to his technic, we believe that, after much experience, equally good results are obtained in the border-line or advanced cases by careful vaginal amputation of the cervix and thorough cauterization without subjecting the handicapped patient to the dangers and slow convalescence incident to opening of the abdomen.

Having definitely decided to perform radical abdominal removal, the uterus is grasped at the fundus with a tenaculum or, what is more satisfactory, a clamp at each cornu along the side of the uterus. The assistant now makes traction drawing the uterus to one side as far as possible, thus putting the broad ligaments and cervical attachments on stretch. The electrothermic clamp, devised by Downes, is applied to the infundibulopelvic and round ligaments, and the projecting shield applied over the clamp to prevent heating or burning other adjacent tissues. As cancer rarely, if ever, invades the upper part of the broad ligaments in early cancer of the cervix, the tissues mentioned may be ligated as in ordinary cöphorectomy in order to save time. The testing of the instruments before the operation and careful lubrication of the blades with sterile olive oil immediately before each application is important.

After the ovarian arteries and round ligaments have been disposed of and the broad ligaments opened, the greatest care must be observed in the exposure and dissection of the base of the broad ligaments. The advantage of having entered the peritoneum anterior and posterior to the cervix by the cautery and gauze dissection during the vaginal step of the operation is now apparent. The broad ligaments and parametria are thus rendered easy to manipulate from below and the dissection and exposure of the vessels and ureters can and should be done with gauze and tissue

forceps without the use of a knife which may implant cancer cells into healthy tissue. The bladder is next retracted high under the symphysis and the ureters pushed aside, after which the electrothermic clamp, preferably with a slight curve, is applied to the parametrium as far distant from the cervix as possible. The tip of the forceps enters the vagina thus including the uterine vessels as well as the rich plexus of veins distal to them. As the clamp is applied the assistant draws the entire uterus to the opposite side to furnish good exposure and to make the parametrium and sacro-uterine ligament tense. In obese patients the deep clamps are sometimes of necessity applied by guidance of the hand placed deep in the pelvis rather than by sight.

Injury to the ureters, bladder, and rectum by the heated clamps is avoided in the manner described, and they are further protected by applying the metal shield which fits snugly over the clamp without damaging the tissues beyond it. As an additional safeguard, moist gauze or pads should be placed carefully around the clamp before the current is applied. In our earlier cases injury to the bladder or ureter occurred in six instances due to neglect of these precautions. The current should be applied to the closed clamp long enough to "bake" the tissues included so that a thin crisp white ribbon is obtained when the clamp is removed. Ninety to one hundred and ten seconds are generally required for the baking, the time depending on the thickness of the tissues included. The resulting ribbon is cut near its inner edge with scissors leaving practically all of it attached in the pelvis. This ribbon does not slough as is generally supposed, but shrinks toward the pelvic wall with less contraction and distortion than if ligated and cut in the usual manner.

The procedure of clamping and baking the ligaments and parametria is repeated on the opposite side, the uterus is removed, and, if the technic has been good, little or no blood is lost. As a general thing no ligatures or sutures are required for the entire extirpation. The cauterized stumps of the vagina anteriorly and posteriorly are next inverted into the vagina by a continuous catgut suture. The bladder peritoneum is now sutured to the deep posterior cul-de-sac peritoneum as in panhysterectomy and the pelvis closed without drainage, unless specially indicated. The question of the removal of palpable glands is still a mooted one. There is no doubt that the complete dissection of all the pelvic glands whether inflammatory or carcinomatous adds greatly to the operative risk. Werder, and others, believe that the adjacent glands may contain some elements

not only resistant to cancer invasion, but, also, under certain conditions, destructive to the cancer cells; and that, therefore, the dissection and removal of all regional glands is of questionable value.

If no unusual complications have been encountered, the convalescence is usually remarkably smooth. In a great majority of the cases there has been even less than the usual amount of postoperative pain and discomfort, a fact which we cannot satisfactorily explain other than by the biological action and morphological effect of heat. The group of cases analyzed in this report includes only operative carcinoma of the cervix that were positive clinically and microscopically, during a period of twelve years, from September, 1905, to September, 1917. The results, while not brilliant, have been found more satisfactory to us than the operative procedures adopted heretofore.

Conclusion.—Igniextirpation for the radical cure of cancer of the cervix by the Werder method has the following advantages: Low primary operative mortality, absence of shock, diminished infection, complete hemostasis, less pain, smooth convalescence, and higher percentage of permanent cures.

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DISCUSSION.

Dr. Arthur T. Jones, Providence, Rhode Island.—I would like to ask Dr. Weiss if, in the operation described, he closes the vaginal vault, then the peritoneal surfaces, and also whether he supports the vaginal vault by sewing in the round ligament ends? Sometimes we get prolapse of the vagina which is very distressing, and if you do not support the vaginal vault and only bring the peritoneal surfaces together, do you keep the vagina tamponed lightly with gauze for a week or so afterward?

Dr. George Van Amber Brown, Detroit, Michigan.—I would like to ask Dr. Weiss one or two questions. First, for one who is not used to working around the broad ligaments and ureters with the

cautery, what are the dangers of injury to the ureters also from hemorrhage and how do you safeguard against such accidents? Do you before operating ever catheterize the ureters?

Major John W. Keefe, Providence, Rhode Island.—Several years ago Dr. Downes, of Philadelphia, described his method of treating these cases. Keith, of Edinburgh, some years ago after applying a clamp, took a hot soldering iron and held it in contact with the clamp so that he had the effect of heat with crushing of blood-vessels and tissues about them. Then Skene, of Brooklyn, looking into the mechanism of an electric flat-iron, devised an angiotribe similar to the Downes clamp, but the temper of the steel was such after using it that the tips of the clamp were not in apposition. Downes spent much time in endeavoring to place platinum in one blade of the clamp, and instead of soldering a piece into the steel as Skene did, he slid a piece of steel over the platinum through a groove in one blade of the clamp. No solder was used, so that he could have a clamp with steel of the proper temper and the clamp could be used for years and not bulge at any point.

I have used that instrument in over one hundred abdominal operations, and I have never had a secondary hemorrhage. It is a simple appliance to use. It has not obtained favor with many surgeons, although Downes tried to introduce it in different parts of the country. He visited the most important cities and demonstrated it, but many of the men who attempted to use it did not give very much thought to the subject. If a man would take that clamp, and experiment with a piece of steak using the proper amount of current, he would get results. With a rheostat it is easy to determine the amount of current necessary. Downes formerly used 60 milliamperes of current with the first clamps he devised. By practising on these pieces of steak, allowing it to remain twenty or fifty seconds, you can soon learn how much time is necessary for the proper application of the clamp. Some leave it on so long that it will burn clear through, and not leave that ribbon-like strip of parchment such as was shown so clearly in the pictures presented by Dr. Weiss. I feel that a person within an hour, should be able to learn the different methods of using this angiotribe. Frequently I use it on the pedicles of ovarian tumors. Sometimes the pedicle is so thick that you have to apply it on one side and then on the other. One can easily remove the appendix or the tubes or the ovaries with it. In these cancer cases, there is no question but that heat is of value, because it destroys some of the cancer cells that may be beyond a point which you cannot possibly reach with the knife.

Dr. Bertha Van Hoosen, Chicago.—When Dr. Weiss presented his report at the meeting of the American Medical Association, I suggested that it might be advantageous to prepare the patients that were going to have this operation with 10 grains of emetin, given in two doses, so that the operation could be done after the patient had received her first dose of emetin. I would like to know if Dr. Weiss has tried that.

I suggested this because, we have noticed clinically that the use

of emetin was followed by a remarkable fibrosis. We have observed this clinically before we were able to demonstrate it microscopically.

Commander William Seaman Bainbridge, New York City.—I would like to ask Dr. Weiss if he does anything to the ulcerated cervix as a preparation for the operation? How does he safeguard the patient from the transplantation of cancer cells into the tissues by the manipulation of the uterus as is necessary in the operation?

Major J. Henry Carstens, Detroit, Michigan.—Dr. Bainbridge has said what I wanted to say. When I got these cases early I took the Paquelin cautery and thoroughly cauterized the inside of the uterus and removed the cancerous tissue. Sometimes it is difficult to do this, but you can curet at first, and cauterize thoroughly before you start the operation. Epithelial cancer follows the law of continuity and involves the mucous membrane. When you have a recurrence you have it in the vault of the vagina, and you have it there because when you cut with the knife you really implant cancer cells. I take the Paquelin cautery, do the operation as shown in these pictures, and with the Paquelin cautery go as far as I can in the vagina and around the broad ligaments and thus thoroughly cauterize the parts, so that there is no danger of absorption or reimplantation of cancer cells of the growth from the surface.

Dr. Weiss (closing).—Dr. Bainbridge brought up a very important point which I should have emphasized, namely, the preparation of the cancer area, and another factor as suggested by Dr. Carstens, investigation of the vaginal canal should be very thorough.

In our early technic we used iodine very liberally in the vagina and all about the cervix, but the use of the cautery is sufficient for sterilization.

A word with reference to recurrences. I do not say we have a hundred per cent. cures, because we do get recurrences in the form of metastases remote from the vagina.

In reply to the question as to the approximation of the stumps of the ligaments, I will say that that is also a very important point because there is nothing more distressing than a prolapse of the pelvic contents, and whenever possible we approximate the stumps, but unfortunately so much tissue is removed that there is very little stump left. We do approximate the round ligaments, however, as their removal is not necessary. The infundibulopelvic ligaments are ligated because ligation is done more quickly than the application of the clamp and we save as much of the round ligaments as possible, as under the circumstances it is the best thing that can be done. We do not use vaginal tamponing, depending upon the approximation of the round ligaments.

Dr. Brown asked with reference to damage to the ureters. We try, as far as possible, to guard against damage to the ureters by resorting to blunt dissection with gauze, and by using tissue forceps to tease the parts away and expose the ureters as much as possible. In about fifteen cases we have had to insert a catheter, as was first advocated by Hunner and Sampson, allowing the ureteral catheter to remain to give us the landmarks, but in our later cases

we have dispensed with that. We think that we can avoid damage to the ureters with ordinary careful technic.

Hemorrhage around the ureters depends upon the manner of dissection. Great care is necessary in applying the clamps on the parametrium close to the ureter, and the surrounding tissues must be retracted carefully. The most tedious and yet the most careful part of the operation is the careful protection of the ureters. If the clamp should be applied close to the ureter, protection by moist pads is of distinct advantage.

In the early series of cases, Dr. Werder and I had four or five ureteral leakages, and I think that in these cases the ureteral leakage was due to the fact that we did not take care to retract carefully while putting on the clamp. It is well to locate the ureters with the fingers and keep them away while applying the clamp alongside, very much after the manner of applying forceps on the head in an obstetric maneuver, using the fingers as a guide.

We have not used emetin in our work, so that I cannot discuss that phase of the question.

I would like to emphasize the point made by Dr. Bainbridge with reference to the danger of implanting cancer. The employment of the cautery has primarily for its object the prevention of recurrence by destroying cancer cells in the area of operation.

SOME UNUSUAL SURGICAL CASES.

BY

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THE cases which I am about to report are of peculiar interest in that they illustrate types of rare abdominal surgery and the results of former injuries likely to be encountered in the day's work.

CASE I.—Mrs. T., twenty-four years of age, housewife, entered the Albany Hospital, April 12, 1906, complaining of pain in the pelvis, foul-smelling uterine discharge, and more or less pain on evacuating bowels. Upon examination a diagnosis of pelvic inflammatory condition was made and operation advised. Patient had one child, denied any other pregnancy or miscarriage, and the cause of the pelvic inflammatory condition could not be found.

At operation a loop of the ileum was found adherent to the left horn of the uterus, and within this coil of adherent ileum was felt a hard cord-like substance. Careful dissection of the ileum, over the fundus of the uterus, revealed a fistulous opening between the uterus and the bowel, which contained a soft rubber catheter, 22 F. size. The catheter was removed and the openings in the uterus and ileum were closed in the usual manner, also the wound. Patient made an uneventful recovery.

Subsequent questioning brought out the information that six months before, believing herself to be pregnant, she had gone to a doctor who introduced a soft rubber catheter into the uterus for the purpose of bringing on an abortion. When the catheter was introduced, the patient felt some pain in the groin and the catheter slipped out of sight. This accident worried the patient somewhat, but did not seem to alarm the doctor, as he assured her that it would come away shortly with the fetus. The abortion proceeded normally, but the catheter did not come away; however, the incident passed from the patient's mind, until she developed the symptoms of pelvic inflammatory trouble.

This combination of circumstances whereby the catheter passed through the horn of the uterus and into the small intestine, rather than into the abdominal cavity, is interesting, illustrating, as it does, nature's protection of the peritoneal cavity.

Dr. Albert Vander Veer has reported a similar case in which an olive-pointed bougie was found in a case of pyosalpinx. Verily, one is led to exclaim, abortions continue, and when they are done

by a practitioner in apparently good standing, what is our line of duty? Convictions by a district attorney are almost impossible. All of us can recall the question asked in court, "Did you see it done?"

Case II.—Mr. H. H. C., sixty-six years of age, representing a class of men who, for nearly a century, have made the Adirondacks inviting and interesting, as guides and camp keepers. The history of these men, as they have seen the development of forest, lake, camp, and stream into enjoyment and recreation for tired and venturesome visitors, is exceedingly wonderful. Their entrance into the woods, when their physical endurance was the only way of bringing necessary food and utensils for cooking, construction, and securing game of various kinds, is a chapter of adventure well worth one's time to hear, especially if the narrator is in a mood for talking freely. To listen to Mr. C.'s narrative of exposures he has passed through, the work that could not be avoided in the building of a camp, in the carrying in of supplies, and in the changes of living and transportation, is a most impressive experience. Accidents and unexpected climatic changes, requiring great reserve powers, are told in a manner to win the admiration of every hearer. At present Mr. C. is the owner of one of the most desirable camp-hotels in the Adirondacks. When a young man, he met with a severe accident, his body being bent double by a heavy beam which fell on his shoulders, and, as he states, displaced all his abdominal organs. He was confined to his bed for six months, under the care of some of the ablest physicians and surgeons in Philadelphia, eventually making a good recovery, and spending the next forty years of his life in the woods, where he was a guide; however, at times suffering much pain in his abdomen.

Five years ago he met with a second accident, very much like the first. A heavy load struck his shoulders and back, crushing him to the ground, and causing a condition of great shock and collapse, from which he slowly recovered. This was followed by attacks of severe pain in the left lumbar region, which appeared to be renal in character, but cystoscopic examination of the bladder made by Dr. J. N. Vander Veer was negative, and *x*-ray examinations by Dr. Berry revealed a fracture of the third lumbar vertebra and consolidation of the lower dorsal, indicating a former severe injury from which he had evidently suffered for a long time. Otherwise, the *x*-ray examination was negative. Urinary analysis was likewise negative. A thorough cleansing of the bowels relieved the condition somewhat, but any overexertion or jar would cause a return of the pain.

In December, 1916, he was thrown into the icy lake, where he was forced to remain for nearly two hours. Following this, he had a severe attack of pneumonia, with an acute congestion of the kidneys. Again he recovered and regained his usual health; but in the middle of March, this year, while lifting some logs, he felt something snap and give way in his right side. Immediately after-

ward he voided blood, this condition continuing for two weeks when he came to the Albany Hospital. When admitted he complained of considerable pain in the right lumbar region and well up under the border of the ribs. On physical examination he presented a small tumor mass just under the border of the ribs (right side). No cystoscopic examination was made at this time. An *x*-ray showed a mass in the right side. Under treatment the blood disappeared from the urine, the mass in the right side decreased in size, the patient gained in weight, and left the hospital at the end of a few weeks feeling much better. After he had remained at home for two weeks, he had a return of the blood in the urine, increased pain in right side, and other accentuated symptoms.

Upon his second admission to the hospital, physical examination revealed that the mass on the right side had markedly increased in size. He complained of frequent desire to urinate, much of this condition being attributed to the beginning of an enlargement of the prostate. After a week's treatment, an operation was advised and accepted.

Oblique incision in the right lumbar region exposed an enlarged kidney, the lower pole especially so. The kidney, with tumor mass, was removed, and the following report made at the Bender Hygienic Laboratory:

April 29, 1918. Organ or tissue, right kidney. Specimen consists of an enlarged and misshapen kidney measuring 15 × 6 × 6 cm. The capsule is thickened, markedly injected, and hemorrhagic. One pole of the kidney presents an elevated and ragged appearance. On sectioning, approximately one-third of renal substance is found remaining, the rest of the mass consisting of yellowish-gray tumor tissue having a lobulated structure. Extensive hemorrhagic areas and a few thin-walled cysts are present. In the renal tissue, which partially encircles the tumor, a number of purulent foci are found.

Histologically the tumor is composed entirely of cells closely resembling the cells of the adrenal cortex. They are polyhedral in shape, and have a markedly vesicular cytoplasm and small round deeply staining nuclei. The cells tend to form acini, although few of these are found fully developed. An occasional acinus is filled with blood, and interstitial and intercellular hemorrhages are frequent. Few mitotic figures are present.

The renal tissue is extensively infiltrated with polynuclear and mononuclear cells forming small abscesses. There are marked degenerative changes in the epithelium of the tubules, many of which contain casts. The glomeruli are largely sclerosed or infiltrated with polynuclears. The smaller blood-vessels show obliterating endarteritis.

Diagnosis.—Hypernephroma. On April 24, 1918, the following analysis was made of the urine, at the Bender Laboratory:

Quantity, 100 c.c.; color, cloudy, light amber; reaction, alkaline; specific gravity, 1016; albumin, negative; sugar, negative; microscopic: amorphous and triple phosphates.

Urine, May 22, 1918; quantity, 100 c.c.; color, turbid, light amber; reaction, strongly acid; specific gravity, 1012; albumin, positive; sugar, negative; microscopic: numerous polynuclear leukocytes and bacteria.

Urine, May 28, 1918; quantity, 120 c.c; color, light amber; reaction, neutral; specific gravity, 1006; albumin, faintest possible trace; sugar, negative; microscopic: a few flattened epithelial cells, moderate number of leukocytes and many bacteria.

Urine, July 17, 1918; quantity, 100 c.c.; color, turbid, dark amber; reaction, strongly acid; specific gravity, 1022.; albumin, present; sugar, negative; blood, present; microscopic: few round epithelial cells, moderate number of leukocytes, numerous red blood cells and a few bacteria.

NOTE.—Tests for Bence-Jones protein are positive.

Apparently there were no metastases of the tumor mass to the surrounding tissues. The growth was very movable, and there were no marked adhesions. Vessels were controlled by catgut sutures, and wound closed with drainage. Patient made a slow but uneventful recovery, passing 15 ounces of urine the first twenty-four hours after the operation. The quantity soon reached 22 ounces and more, clearing, with freedom from pus, mucus, phosphates, and urates, and at present the urine is quite normal, the patient being relieved from all former pain and distress, including the periodic headaches from which he had suffered for many years, and which were supposed to result from intestinal stasis.

The interesting point in this case is the fact that up to within the time this patient began to pass blood he complained that all the symptoms were on the left side. Why this condition of the kidney, so apt to appear in early life, should have remained quiescent so long is difficult to say; but it is fair to assume that the severe drenching in icy water, causing the acute congestion, was the starting point of this new-growth. None but an Adirondack guide could have survived so many exposures and injuries.

This case also illustrates the value of the *x*-ray. If it had been used when the first accident occurred, a correct diagnosis of fracture of the lumbar vertebra could have been made, the proper treatment applied, and the patient saved years of suffering.

CASE III.—Mrs. L. S. W., forty-five years of age, housewife, married, no children. Twenty years ago developed a tumor in the lower segment of the abdomen, and diagnosis at the time was not

absolute. She was operated upon by Dr. Albert Vander Veer, and the case proved to be a cyst of the urachus. It was afterward reported in the Philadelphia *Medical and Surgical Journal*, vol. lxi, and also in the discussion of Dr. Douglas' paper, Transactions of the American Association of Obstetricians and Gynecologists, vol. x.

The cyst was dissected out, and as it was very adherent, the operation was exceedingly difficult. An effort was then made to enter the peritoneal cavity, but this could not be done, as the operator stated, probably because of extensive adhesions following a previous severe peritonitis.

The patient remained well up to five years ago, when she noticed a gradual enlargement in the lower part of the abdomen, with increased menstrual flow, frequent urination, and difficulty in getting a passage of the bowels. This condition prevailed up to April of this year, when she consented to an operation.

Past History.—When fifteen years of age, she had an undoubted attack of appendicitis, with peritonitis, but did not undergo an operation.

Operation.—Incision made through old scar and 2 inches below the umbilicus, an opening unexpectedly made into the bladder, the fundus being firmly adherent to the anterior abdominal wall and to the cicatrix. This condition was not surprising, considering her first operation. Incision in the bladder closed, and another made just above and to the left of the umbilicus. Realizing I had a difficult case to deal with, I dissected the tissues very slowly and carefully, hoping I might reach some anatomical landmark that would lead me into the abdominal cavity. After some effort I uncovered what I hoped might be the peritoneum, but was surprised to find it was a loop of the small intestine. This portion of the small intestine was firmly adherent to all surrounding tissues. Opening in bowel was carefully closed. By further careful dissection between these two incisions I found it was possible to open down upon a fibroid tumor, which was discovered to be adherent to all the surrounding structures. The tumor was multiple in character and connected with a cyst of the right ovary and tube. I was not able to locate the left ovary and tube. Apparently a wall of peritoneum and adhesions separated the uterus from the rest of the abdominal cavity. I must confess that at this time in none of my many abdominal operations was I ever so much at sea regarding the relations of structures. After persistent prolonged dissection the fibroid tumors were peeled out of the pelvis, the right tube and ovary were removed, and much care was exercised in looking for the ureters. There was considerable bleeding, but all hemorrhage was finally controlled and wound closed with drainage. At no time was I able

to recognize the contents of the abdomen, save that portion of the intestines to which I have referred. In no place were the intestines adherent to the tumors, nor were they in evidence, being completely shut off from view by a layer of adhesions.

The patient made a good recovery, has gained in weight, has good evacuation of the bowels every day, slight menstruation every four weeks, and all her other functions normal. The menstrual flow probably is due to a piece of the left ovary and tube being left and the menstrual fluid forming a new channel along the stump of the cervix.

The interesting feature in this case is that the uterus, tumors, and right appendages could be removed *via* the suprapubic route, practically without entering the abdominal cavity. I have been unable to find a similar case reported in literature.

Case IV.—Mr. W. L. R., fifty-five years of age, architect, presented himself for examination Feb. 12, 1918, complaining of passing feces and gas through the penis, and urine through rectum. Gave a history that when a boy fifteen years of age, he had an abscess in the left groin, which discharged more or less for six months before healing spontaneously. No further trouble until two years ago, although always more or less constipated. At this time he suffered from a typical attack of renal colic, left side, and was supposed to have a pus kidney, with, probably, a renal calculus on that side, although *x*-ray by Dr. Berry and microscopic and cystoscopic examination, by Dr. James N. Vander Veer, were negative. Soon after this Mr. R. noticed what he thought was the expulsion of some flatus through the penis. This condition gradually grew worse until material similar to feces appeared in the urine, and upon examination proved to be feces. *X*-ray examination at that time, by means of a bismuth enema, was negative, though he passed some of the bismuth through the urethra. Cystoscopic examination by my assistant, Dr. Lyons, at this time, however, was negative. Operation advised and accepted.

At operation the entire pelvis was found to be filled with adhesions, and a loop of the ilium was firmly fastened to the fundus of the bladder. This was so firmly adherent that it was necessary to resect 4 inches of the gut, and a lateral anastomosis made. No fistulous opening between the bladder and intestine was found. Further search showed the rectum adherent to the bladder, and still further investigation revealed a fistulous opening between the rectum and the bladder. This was cautiously dissected, the openings were sutured, and the wound was closed with drainage.

The first twenty-four hours the patient voided 15 ounces of clear urine, and the second twenty-four hours the urinary output had increased to 30 ounces of absolutely normal urine. No urine passed by rectum, and no flatus expelled through the urethra, passing through the rectum in a normal manner.

Unfortunately, just after the end of the second day, his heart began to weaken, he developed acute myocarditis, and in spite of all treatment passed away at the end of twelve hours.

In commenting upon this case it is interesting to inquire as to the original source of infection, when the patient was fifteen years of age. Surely it did not occur in the appendix, as that was found normal at operation, and the abscess was on the left side; however, we must recognize left-sided appendicitis. There is no question but that, at the time of this abscess, he had a general peritonitis, with the resultant adhesions of the intestines to the bladder. Then two years ago, undoubtedly, in the passage of some of the gravel, on the left side, an irritation and ulceration of the bladder wall were set up, which eventually ulcerated through into the rectum, causing a vesicorectal fistula, a condition I have never seen before in the male, and concerning which very little is written.

I present these four cases as types of unusual abdominal conditions which we may be called upon to meet, and they forcibly illustrate the fact that in opening the abdomen the surgeon must be prepared to deal with surprises and emergencies.

DISCUSSION.

Dr. John F. Erdmann, New York City.—Mr. President: In the last case reported by the essayist he doubtless had a diverticulitis of the sigmoid, with perforation into the bladder, one of the most frequent sources of exit of abscess we have in diverticulitis. It is a condition that is relatively frequent in diverticulitis. I have reported some thirty cases, three of which perforated through the bladder. These inflammatory conditions take place in fat men, and they may take place in patients somewhere between forty and seventy years of age. One of my patients was seventy-three years of age; the majority of them are forty-five and fifty years of age. We find not only feces but fragments of corn, and blueberry seeds, that these patients have been eating. In one of my first cases I resected 8 inches of the sigmoid; there were two perforations in the bladder, and two perforations in the sigmoid. There were two perforations in the ileum, all from diverticulitis. One patient, a sea captain, seventy-three years of age, whose condition was precarious, therefore no operation was done. Following a rupture through the bladder he passed some feces, in addition to the pus by the urethra, and made a recovery. Some three years subsequently he died of pneumonia.

These cases are more frequent than one is led to believe from the literature. Instead of being in the rectum, I would differ with Dr. Vander Veer as regards the anatomical distribution of the gut.

We call that the lower sigmoid because the rectum begins with the bend corresponding with Douglas' pouch down to the anus.

As far as the hypernephroma cases are concerned, it is quite frequent to find hypernephromata in elderly people. I removed one six months ago in a patient seventy-six years of age. I have removed several of them in patients beyond the age of fifty-five or sixty without a particle of difficulty.

Major John W. Keefe, Providence, Rhode Island.—When Dr. Vander Veer was reading his paper and Dr. Erdmann in his discussion spoke of diverticulitis of the sigmoid, which is now frequently called the pelvic colon, I was reminded of the case of a man, forty-five years of age, who had a diverticulitis for which I operated and drained, and one year following he had feces and gas pass through the urethra. I opened his abdomen and resected so much of the gut that it was necessary to make an artificial anus which he has at the present time, and then closed up the bladder, and he is perfectly well so far as his urinary condition is concerned.

THE HEART OF A PREGNANT WOMAN.

BY

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CHILD-BEARING is a physiologic process. For any deviation from the normal we find an explanation in a pathologic condition of father or mother. The growing fetus, through its automatic cardiovascular system, controls its own metabolism—intake and output—with such accuracy that the average mother is not conscious of its presence until active movements become so vigorous that they cannot escape her attention. Nausea and vomiting, serous or bloody discharges, palpitations or depressions, and mental disturbances are symptoms pointing to definite pathologic disturbances whose earliest recognition is the chief aim of prenatal care.

The prognosis for a successful delivery ought to be as favorable for an older as for a young primipara, if it were not for the infections to which the older woman has fallen victim during the delayed prenuptial period. While disturbed metabolism manifests itself to patient and physician through dizziness, nausea, and mental derangement, affections of the cardiovascular system may be present without causing more discomfort than a slight dyspnea.

Many patients learn that their hearts are defective, through the routine examination, when consulting the physicians as prospective mothers. The physician himself will frequently be surprised to find loud murmurs and other signs of cardiac involvement in patients whom he had considered absolutely sound.

Is this disturbance of recent origin, or is it an aggravation of an old lesion? This is the question that we have to answer. The prognosis for a safe delivery and perfect involution depends largely on this point.

Care in the taking of the anamnesis, therefore, is of the utmost importance. Barring the sporadic cases of congenital heart affections, which by their severity impress themselves on the observer, chronic heart lesions have their origin in infectious diseases. Our views at present hold the streptococcus invasions of nasopharynx and teeth mainly responsible; therefore, why not quarantine against the common every-day variety of colds? Laziness is not a bad

habit. Laziness is a symptom of disease, most often due to anemia or poor circulation. The adolescent girl who prefers her books and needlework to the frolics of her age must arouse our suspicion. The blond-haired woman, with a complexion like milk and roses, with the rounded form of excessive adiposity and the ever-smiling countenance, is the type of chronic myocarditis, eventually mitral leak; her sluggish metabolism makes her an easy victim to toxemias, and her poor circulation to postpartum hemorrhages.

Of particular anamnesic importance is the character of the menses. The passive congestion of the abdominal organs will lead to profuse, prolonged, and dark-colored discharges; the number of days is frequently extended to seven or nine, and the number of napkins wasted to ten or twelve per diem; the patient has hardly time to recover from one period to the next. Ergot is of no avail; but the use of digitalis will certify to the correctness of the diagnosis.

Previous deliveries may have caused an aggravation of cardiac affections which are, so far, mild; through the concomitant puerperal infections they may have given rise to acute involvement of the heart. When a woman complains of never having regained her usual strength and vitality after labor, a myocardial weakening must be suspected, a very serious prognostic point for subsequent pregnancies.

As a source of constant discharge of septic material into the system, pyelitis, due to catheterization or directly to puerperal infection, certainly rivals dental or tonsillar abscesses. As the frequent occurrence of pyelitis is now being recognized more and more, the draining of the pelvis of the kidneys by catheterization, competes in popularity with tonsillectomy and the extraction of teeth.

Naturally, we think first of anatomic changes that have taken place under the influence of bacterial invasion when we find loud murmurs, arrhythmia and lack of tone on examining a heart. But the extra amount of work imposed upon the pregnant woman's heart affords a sufficient explanation for the frequent occurrence of purely functional disturbances. Particularly during the second and third, and then again during the ninth (lunar) month, the encroachment of the uterus on the intestine will lead to inflation of the colon and pressing upward of the diaphragm, the right heart suffering especially, with dyspnea and cyanosis as symptoms as well as soft, blurring murmurs over the base. We miss, however, the accentuation of the second pulmonic sound, indicating a permanent change in the muscles of the heart. These functional

murmurs increase and decrease during the progress of the pregnancy, sometimes disappearing altogether for a long period. The greatest difficulty in differentiating between definite changes and conditions of a purely passing character is experienced in acute infectious diseases, where the by-products of bacterial life cause a temporary poisoning of the muscles of the heart, with all the outward symptoms of an acute myocarditis and endocarditis. As the concomitant hyperpyrexia may lead to the death of the fetus, a true puerperal sepsis may be superimposed upon the original myocardial insufficiency; and a virulent endo- and myocarditis develop. Otherwise the murmurs, cyanosis and dyspnea gradually disappear with the relief of the infection, leaving behind, however, a marked sense of fatigue and depression.

The same condition has been found repeatedly in cases of toxemia in pregnancy, where with the increase of albumin and blood pressure, dyspnea, cyanosis, enlargement of the heart to the right and loud basal murmurs were observed. In a recent case the diagnosis of an aortic insufficiency complicating a mitral leak and stenosis played a prominent part in the prognosis of an eclamptic patient; the return to the norm included the disappearance of all the cardiac symptoms observed. The anamnesis in this instance did not bring out any previous circulatory disturbance. The products of an insufficient catabolism of purin bodies must have the same influence on the myocardium as the life products of infectious germs. Or are the toxins of pregnancy of bacterial origin? In the same category of cases we must rank the syndrome of hyperthyroidism, with its most prominent symptom, the tachycardia. As a parenchymatous enlargement of the thyroid gland is a physiologic occurrence in pregnancy, the difficulty of diagnosis increases when we consider the nervous strain to which so many of our patients are exposed through the novelty of expectant motherhood.

The circulatory disturbances discussed so far have hardly a direct influence on the development of the child; nor do they offer any serious problem in labor or during the puerperium. True cardiac affections with anatomic changes involving the myocardium or the function of the valvular apparatus must be taken very seriously. For the obstetrician, the paramount question is rather the ability of the heart to perform the work imposed upon it, than the making of an accurate diagnosis of the existing lesion.

It is more important to recognize a myocardial weakness than to localize the single lesions of multiple valvular affections.

In cardiopathics we cannot draw a line of demarcation between

endocarditis and myocarditis. The endocardial lesions form but the permanent results of the underlying infections. The heart as a whole adapts itself to the newly created mechanical conditions by the process known as compensation. On the amount of compensation achieved and maintained depends the functional capacity of a heart.

Compensation, however, is a relative condition, governed by the amount of work to be met by the cardiovascular system. A careful examination of a primigravida may show a heart in perfect working order, although the anamnesis reveals repeated attacks of infectious diseases. Here the main point to be cleared up is whether any of those infectious affections involved the heart and whether there is a history of a breaking down of compensation under effort.

We do not accept the results of auscultation as final in the diagnosis of a heart lesion, so we must not call for extreme dyspnea, weakness, and edemas as necessary symptoms in the diagnosis of a broken compensation, at least as far as our anamnesis is concerned. Less conspicuous symptoms must arouse our special attention, as they may prove valuable warning signals of imminent danger. Insufficiency of the propelling force of the heart will be shown in a low blood pressure, or better still, in a low pulse pressure.

Low pressure is as inportant in pregnancy as high pressure. I have mentioned above the frequent simultaneous occurrence of toxemia and cardiac disturbances, the same inciting factor leading to either pathological condition. Relatively low pressure in conjunction with a steadily increasing amount of albumin and of blood nitrogen, with granular casts and blood cells, must be considered a more serious complication than a pressure corresponding in volume with the other symptoms—it presages early collapse—a 'cave' to the anesthetist. The absence of accentuation of the second sounds over the aorta or pulmonary artery, the displacement of the cardiac outlines, and the change in intensity of murmurs over the ostia will prove of more momentum in drawing our final conclusion about the actual working power of a heart, than the more spectacular thrills and murmurs of a well-compensated heart. The sudden changes from a highly colored complexion to the paleness of anemia, showing a marked contrast between the rosy cheeks and waxy white skin; the pale conjunctiva with dark red dilated veins; the high colored ears permitting the observation of the blood-vessels when sunlight falls through them—all these symptoms are familiar to us, as indicating circulatory weakness.

I do not depend as much on the observation of the lips, for cosmetic reasons, as on a careful study of the finger nails. Their

color, shape, and brittleness tell the tale of nutrition; cross ridges showing on all the fingers alike tell the tale of the past—of malnutrition of the matrix as many months ago as they correspond to the growth of the finger nails. A marked depression will, as a rule, disclose the history of an infection (tonsillitis, grippe) or physical disturbance serious enough to have caused an intense agitation of the heart. Allowing the patient's finger tips to rest on your own, a slight pressure exercised on the fingerberry quickly increases the cyanosis, a sign of lowered vascular tonicity. The importance of these milder forms of carditis lies first in the possibility of exacerbation, of the changing from the chronic into the acute form, and then in the direct effect they have on labor and the puerperium. Any condition that influences labor must affect the course of future pregnancies—an endless chain of pathological events.

A primary acute carditis is of rather rare occurrence, but recrudescence of quiescent processes is more frequent than is usually realized. While attending to the older children, a multipara is constantly exposed to infection; hence the importance of extending proper hygienic precautions to the expectant mother.

An early diagnosis is the chief factor in successful therapeutics. The menstrual disturbances, the aversion to physical exercise, and the vasomotor symptoms already described will help us greatly in singling out suspicious cases. To depend on marked objective changes in the heart and the general system will cause us to lose valuable time. If a heart affection has progressed to a point where drastic measures are unavoidable, irreparable damage has been inflicted on mother and fetus. Under drastic measures I include prolonged and absolute rest in bed, the use of opiates and large doses of digitalis all of which must interfere with a normal metabolism, so essential in this condition.

The first prophylactic steps ought to prevent impregnation, the prohibiting of marriage, or the avoiding of conception. If, however, conception has taken place, the pregnancy in all but the severest cases must be carried to term. The interruption of pregnancy offers as many chances of a cardiac breakdown as a normal, well-conducted delivery—except in the case of an abortion induced before the formation of the placenta has begun. If a patient with a well-compensated heart lesion presents herself for our prenatal care, we must impress upon her mind the necessity of preservation of energy. Saving alone does not suffice, but the development of new vital forces is needed. Not rest alone, but rest and exercise. We demand regular exercises and careful attention to elimination

in every normal case; we must control both of them most minutely in heart cases. It is as wrong to allow a patient to depend on cathartics instead of using physiologic means to secure periodic movements of the bowels, as it is wrong to take from a heart muscle the chance of gradual development, by imposing long periods of rest. Strike a balance between rest and exercise, give distinctive instructions as to the amount, and eliminate half-resting, such as sitting or standing about, as much as possible. This treatment, for instance, refers to automobiling, which I do not favor unless it serves to bring the patient to the outskirts of town, where she can begin to walk. There is no objection to a picture show, if a well-ventilated house serves as a resting place between walks. But if the least sense of fatigue is experienced, the patient ought to seek the recumbent position, after loosening all her clothes, so that complete rest may be secured. Massage and calisthenics will help out considerably, but must not be recommended, when outdoor exercise is available. It is a good plan to become personally acquainted with the patient's home environments, as stairways or steep approaches may offer unlooked-for obstacles in the way of moderate exertion.

The blood pressure readings will assist us greatly in controlling our patient's work. Their significance where heart lesions and toxemia co-exist has been pointed out before. Between the thirty-fourth and thirty-fifth week of pregnancy daily observations will be necessary in order to determine the proper time of interference. During this period such patients are better if strictly confined to bed. As soon as settling has occurred, a considerable amelioration of symptoms is frequently observed, and the patient may be given more liberty of action.

Shall we advise the removal of offending tonsils or teeth? I never hesitated to do so and have not seen any harmful results through increased reflex stimulation. Headache and rheumatic pains due to those toxic influences, call frequently for the use of coal-tar preparations. There is more harm in their heart-depressing influence than a short local or even general anesthesia would produce. Any nasopharyngeal or dental work must be attended to, not in spite of, but on account of the patient's condition.

And last but not least, digitalis. Digitalis means rest—rest so that more work can be done—a prolonged diastole anteceding a strong systole. It is not a stimulant, it is not a food, but it does for the heart what we must do for our patient; it regulates work and rest.

DISCUSSION.

Dr. William M. Brown, Rochester, New York.—In recent months I have had to take over a large prenatal clinic, and while I have accepted low blood pressure readings as more or less normal with the pregnant condition, it has come home to me really what it might mean. In these prenatal examinations where they run from twenty to forty in the afternoon, I have been impressed with the large number of histories that come from patients who are otherwise apparently normal, with no particular previous histories of their pregnancies. The history had a note of systolic murmur at the base. So many of these came through in that way that it began to make me wonder, and at present I am inaugurating a follow-up system in these cases to see what becomes of this murmur after delivery. There is no other lesion, but there is a low pulse pressure. In over 15 or 20 per cent. there is a systolic pressure of 95 to 105 persisting right straight along.

I am going to have these histories followed up and these patients watched for a sufficient length of time to see whether these patients will deliver themselves normally; to see whether there is permanent damage to the hearts or an expression of the puerperal toxic condition. I had a forcible illustration of what might happen during the past week when I was called in the middle of the night by a physician to see a patient whom he had delivered earlier in the night and over whom he was very much worried. I felt when I saw the woman that he had a right to be worried. He was a man in whom I have every confidence, and when he told me over the phone the history of the case, I did not see how I could do anything. The history of the case is briefly this: Simply a low forceps delivery, with the ordinary amount of bleeding that he did not consider of any moment, and yet the patient very shortly afterward went into apparent collapse. She was white, but not exactly exsanguinated, and the ordinary amount of stimulation brought no results. He did a saline transfusion and various other things, and got no response from them. When I saw her, from a superficial examination of the abdomen, and so on, I was perfectly convinced of the condition that existed. He feared there was primary rupture of the uterus, but I did not think so from my examination of the fundus of the uterus. I put my stethoscope to the heart and I could get one heart sound, and that was weak. I considered that she had an acute dilatation of the heart, but whether she had had a previous heart lesion I do not know. Heroic digitalis treatment was instituted, and within half an hour there was a pretty good snap to the heart sound, and in a short time a second sound developed and in the morning she was all right. She was perfectly conscious and had a good pulse.

Dr. Arthur J. Skeel, Cleveland, Ohio.—Anybody who routinely examines the hearts of pregnant women, will surely come to the conclusion that murmurs mean very little in these cases. As the doctor has said, you can go over case after case and in probably 50 per cent. of these women you will get a systolic murmur at the base. I

have long felt that a systolic murmur at the base in a pregnant woman meant very little.

In regard to the later history of these patients who have myocarditis and an old chronic endocarditis, I am not prepared to say. There is no question whatever but that pregnancy does shorten their lives, but as to how many of them show marked indications of their cardiac condition following labor I cannot say. But I am much impressed with one particular thing, and that is, that some of these old cases become acute and make serious trouble at the time of labor. They are the class of cases which we ordinarily designate as cardiorenal disease. All of the cases do not get so bad that you need to fear collapse during labor, but some of them do. These cases will invariably show albumin and casts in abundance, and all the evidences of cardiorenal disease. In one of them the blood pressure (systolic) had been 200 for a month, and her urine was loaded with albumin. She was a primipara, forty-three years of age. She showed evidences of cardiac involvement and was at term. We induced labor, and had a rather prolonged first stage; as soon as the second stage began we did a forceps delivery without any special trouble. The woman had an acute dilatation of the heart and died within a couple of hours. She had myocarditis with toxemia, and the heart collapsed under the strain.

Another case, which was brought to me comparatively recently, came into the hospital with a history that she had not been able to lie down or sleep for four days and nights. She was at term. She was edematous. The urine was loaded with albumin; she did not have high blood pressure because the heart was not able to support the circulation. It was a question how to get her out of difficulty. I have resorted to a little scheme a number of times which I undertake to relieve these women. The strain these hearts are under makes you feel that the added strain of labor will produce a complete collapse. I have a number of times simply ruptured the membranes by shoving a sound up through the cervix, allowing the liquor amnii to drain away first, and after eighteen or twenty-four hours the heart will have recovered sufficient tone to enable you to bring about delivery with safety. That was the case with this woman whom I delivered sitting up in bed. She had not lain down for nights. She recovered. The state of her heart has improved considerably over what it was. We must think of the future health of such women. Those cases that become so bad during labor always show involvement of the kidneys beforehand.

Dr. James E. Davis, Detroit, Michigan.—I believe greater emphasis should be laid upon what we term the endocrinal system. The conditions that obtain in almost every pregnancy are such as to disturb this system to some extent. One may study, for instance, the thyroid gland alone during the menstrual changes, and we find there is always a hyperemia, perhaps some degree of hyperplastic change in the gland. If one pregnancy succeeds another in rapid succession, there is always a very marked hyperplasia of the thyroid gland, and a certain phase of the hyperplasia always means a

marked increase in the metabolic processes of the body. The thyroid gland, as we all know, has a very rich blood supply, and any slight increase in that blood supply produces very marked and profound changes in the gland. We may have either in the hyperfunctioning types, or in the hypofunctioning types of cases a disturbance in the metabolism during the pregnant state.

It is very interesting to study carefully the cases of toxemia of pregnancy, especially those of the eclamptic type. When you search diligently for pathology, you are disappointed in finding nothing but a cloudy swelling or increased blood supply in all the tissues. However, this is not the case with the functions for they have been profoundly disturbed. After we study a case for a period of years, after eclampsia, there is a train of symptoms interesting to observe. The thyroid gland is usually large, and there is marked hyperplasia and also changes in some of the other endocrinal glands and in the liver. The marked changes in different tissues show that there has been a profound disturbance of the circulatory system.

To connect what the doctor has brought out very forcibly in his paper, the effect of infections, particularly focal infections, many of them, especially the infections of the tonsils, have a profound etiologic effect upon the thyroid gland, and this in turn has an effect upon the heart muscle during the pregnant period, or we may have the two acting together. The degenerative changes in the heart muscle may be small or very profound, occurring as we find the changes in the thyroid gland. To my mind, I think a close study of the thyroid conditions would explain many of the changes in the heart muscle and the old fibroid changes that we find in cases where the condition has been repeated over and over again.

Dr. Burckhardt (closing).—Dr. A. E. Skeel is thoroughly in accord with the views enunciated in my paper, and I want to say to him that in the last case of puerperal eclampsia I had, where there was considerable albumin, the blood pressure arose from 179 to 190 systolic, and diastolic 220 to 230. I ruptured the membrane at once and brought on delivery.

I have had three cases within two weeks in the University Hospital, and I adopted the plan of systematically inducing labor, and this being a multiparous case, I simply punctured the membrane.

I cannot agree with what Dr. Davis has said, for while I admit that the thyroid gland is the component gland of the whole glandular system, it does not play such an important rôle in these parturient cases as a great many think. I do think, however, the first expression he used, namely, the endocrinal system, is the preferable term, because how do we know whether the hypophysis does not have as much to do with many of these physiological changes as the thyroid gland.

What was said with reference to mitral stenosis and mitral regurgitation must be taken with a grain of salt, because we get many murmurs and soufflês that are of transitory character.

Only a short time ago we had a case that was examined by a specialist, which had all the indications of aortic insufficiency with

a mitral stenosis at the same time. After delivery the whole complex of symptoms disappeared.

One of the main points to be borne in mind in discussing obstetrical cases is that general practitioners must not think of the university and the hospital staff, but think of the multiplicity of cases that have to be handled and treated outside of such institutions, and it will be much easier for general practitioners to make a diagnosis about the breaking point of compensation having taken place previously than to make a diagnosis of aortic insufficiency or aortic stenosis. I taught clinical medicine for a number of years, and if you were to ask me to make a diagnosis of aortic insufficiency, I would back out.

FORCEPS ROTATION OF THE HEAD IN PERSISTENT OCCIPITOPOSTERIOR POSITIONS.

BY

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Four years ago the writer prepared for this Association a paper on occipitoposterior positions of the vertex with special reference to the Scanzoni maneuver. The paper was, however, not read, and hence no discussion of the subject took place. The reason for presenting a paper on the same subject at this meeting is that there is still a considerable difference of opinion as to the value of this operation, and also as to the technic of the procedure in those cases in which it is performed. The technic which I used has not changed during the last four years; but I wish to present the result of additional experience with this operation, to emphasize the important steps in the technic of the procedure, and to point out certain ways in which it differs materially from that usually employed in such cases.

In my previous paper I spoke of this forceps operation as the Scanzoni maneuver. Perhaps I should have spoken of it as a modification of the Scanzoni maneuver, for it differs in several very important details from the technic usually described as that of the Scanzoni maneuver. No doubt can exist as to the importance of the subject of occipitoposterior positions of the vertex, for these cases furnish the bulk of the obstacles confronting the physician in general practice as well as the obstetrician; and bungling work in the use of forceps in such cases has resulted disastrously for many babies as well as injuriously to many mothers. In no branch of obstetric practice is such blind and unscientific work done with the forceps as in the delivery of cases of occipitoposterior positions. To be sure, in the majority of cases of occipitoposterior positions the head will rotate spontaneously during the course of labor; but in a considerable proportion of cases no rotation occurs, the occiput remaining persistently posterior; and in a small proportion of cases the occiput rotates to the hollow of the sacrum. In few of the persistently posterior positions of the vertex does spontaneous birth take place, and in many of the cases in which rotation occurs spontaneously it takes place only after several additional hours of ex-

cessive labor pains, which certainly can do the mother no good and can tend only to have an injurious effect upon the child because of the unnecessary pressure upon its head. In the group of cases in which forceps rotation is indicated are included not only the cases in which the occiput remains persistently posterior, but also those cases in which it does not rotate readily, but only after unnecessary prolongation of labor.

Pituitary preparations have been used in these cases with the hope that an increase in the force and frequency of the labor pains will result in rotation of the head; but it is the writer's belief that this procedure is attended by some danger, inasmuch as in those cases in which the head does not tend to rotate readily there is an obstacle to the birth on account of the faulty position; and we are simply stimulating the uterus to excessive activity against an obstruction, a procedure which is not recognized as safe and justifiable. The same argument applies to the use of forceps in attempts to extract the head while it is still in a posterior position, whether the plan is to deliver it in this position or to trust to the gradual rotation during the traction, which must be excessive in its force. The latter is a method altogether too commonly described in our works on obstetrics, and could be omitted entirely without detracting from our sum of obstetric knowledge. A more rational method is first to correct the abnormality of the position, and then to conduct the birth in the most approved manner.

Following this plan, the writer has uniformly made use of a method of rotating the head with forceps and has found it a most satisfactory procedure and one which has converted very difficult cases into comparatively simple ones. His experience includes 249 cases in which the head has been rotated with forceps. Of these, 149 were one-para, seventy-seven cases two-paræ, seventeen cases three-paræ, and six cases four-paræ. In 170 cases the position of the vertex was right occipitoposterior, and in seventy-nine cases the position was left occipitoposterior. In 104 cases the head was at the pelvic brim, its greatest diameter not having passed through. In eighty-eight cases the head was in the pelvic cavity above the spines of the ischia, and had not entirely passed through the os. In forty-three cases the head was in the pelvic cavity and had passed entirely through the os; and in fourteen cases the head was at the pelvic outlet. In eleven of the last fourteen cases the occiput had rotated into the hollow of the sacrum, the sagittal suture lying practically in the anteroposterior diameter of the pelvis.

In all of these cases the head was rotated with the forceps until

the occiput came directly under the symphysis. The rotation was always made through the smaller arc, *i.e.*, from R. O. P. to R. O. A., and from L. O. P. to L. O. A. Thus the rotation occurred through an arc varying from 100°, in the cases in which the sagittal suture lay nearly transverse, to one of 180° in those cases in which the occiput lay in the hollow of the sacrum. No difficulties were encountered in the rotation in any of these cases. Success in this method depends entirely upon carefully following every detail in the technic, and it is the writer's belief that failures in attempts at rotation are always due to some deviation from the important steps in this technic. Of course, it is absolutely essential that the exact position of the head be determined so that the forceps may be made to grasp it with a true cephalic application. In this instance, as in all cases, forceps should never be applied until an exact diagnosis of the position of the head has been made. There is no place in obstetrics for the pelvic application of forceps where the forceps are applied merely with reference to the pelvic cavity and are allowed to grasp the head in any manner in which they happen to. The statement is often made that straight forceps, that is, those without a pelvic curve, should be used for rotating; but if the forceps are turned in such a manner that the blades lie continually in the same axis, any good forceps may be used. The writer has preferred the solid blade forceps because they are more easily applied, their thinner blades take up less room in the pelvis, the smoothness of the blades facilitates the rotation, and they are more easily removed after the rotation is complete. As has been said before, a good cephalic application is made and in such a manner that the concavity of the pelvic curve of the forceps looks toward the front, that is, toward the child's face in cases of posterior position. This gives in reality a reverse application as far as the child's head is concerned. Thus, in a case of vertex R. O. P., the forceps are applied as if one were dealing with a case of vertex L. O. A.; and in the case of vertex L. O. P., as if it were vertex R. O. A.

Inasmuch as there is invariably poor flexion of the head in cases of posterior position, the blades are made to lie more nearly in the occipito-mental diameter of the head by depressing the handles before hooking them. The forceps are then locked firmly and the rotation is accomplished as follows:

The handles are first raised in the direction of the child's face and then carried around in a large circle, first toward the patient's thigh, and then posteriorly. The preliminary elevation of the handles

tends to favor flexion of the head; and the large sweeping movement of the handles tends to keep the blades of the forceps in the same axis throughout the rotation, thus allowing the head to turn without difficulty. Up to this time no traction whatever is made, traction being employed only after the head is in a normal anterior position. No force is required in this rotation if properly carried out. Failures in rotation or the necessary employment of force occur only when the operator tries to rotate the head by twisting the handles instead of sweeping them through a large circle. The rotation should never be accompanied by traction, but the head should be turned in that part of the pelvis in which it happens to lie whether at the brim, in the cavity, or at the outlet; and in some cases in which the head seems to be too firmly fixed in the pelvis, it may even be pushed up to a slightly higher level, where it will be somewhat freer to rotate. Too great emphasis cannot be laid upon this step of the procedure. The method so often advised, that of first drawing the head down to the pelvic floor and then rotating it, is never advisable, for unnecessary force must always be used in drawing it down to this level while the occiput is still posterior.

The same objection applies to attempts to deliver the head in its posterior position without rotating it. The writer has found it about as easy to rotate the head in one part of the pelvis as in another. Injuries to the maternal soft parts have not been observed when the rotation is carried out in this manner, and are undoubtedly due to attempts at rotation and traction simultaneously. The latter procedure should never be followed. After the rotation is complete, the forceps are naturally upside down and must be removed and re-applied; but before one removes them, it is justifiable to make slight traction so as to fix the head in its new position, and tend to prevent a return to the old position before the re-application is made.

In rare cases the head slips back before the re-application is made and has to be rotated again. In making the re-application it is important to apply the posterior blade first, as this tends to support the occiput and prevent its rotating backward during the application of the anterior blade. After the second application, the delivery is accomplished as in any normal case of anterior position. It is surprising to see the difference which the rotation makes in the ease of delivery. Often, especially in the case of multiparæ who have been laboring hard with no progress, the head descends to the perineum with very little traction after the rotation, a marked contrast to the case in which under similar circumstances the physician pulls with all his might upon the unrotated head. Manual rotation of the

head in the hands of some men has apparently proved very satisfactory, and is also a thoroughly scientific procedure, but the writer prefers to rotate with forceps because in doing so he does not displace the head materially from the level at which it lies in the pelvis, while in using manual method the obstetrician must insert the whole hand into the pelvis and push the head upward in order to grasp it. I would, however, urge manual rotation of the head as far preferable to any attempt at traction upon an unrotated head.

The time during the labor at which the forceps are applied naturally varies in different cases, but as a rule it may be said that there is no interference with the first stage of labor, and a reasonable time is allowed for spontaneous rotation. Reasonable time would be determined by the judgment of the obstetrician, who should consider only the best interest of his patient and the unborn child.

To sum up the important steps of the maneuver, the following are essential:

First.—An absolute diagnosis of the position.

Second.—A true cephalic application of the forceps.

Third.—Rotation without any traction whatever.

Fourth.—The sweep of the handles of the forceps through a large circle.

Fifth.—Slight traction to fix the head in its new position.

Sixth.—The application of the posterior blade first in the second application of the forceps.

Personally, I know of no procedure in obstetric practice so entirely satisfactory and attended with such uniformly good results as the rotation of the head with forceps in cases of occipitoposterior positions. The greatest abuse of forceps consists of the employment of excessive traction force, and this procedure eliminates this force by simply converting an abnormal and unusually difficult presentation into a perfectly normal and easy one. The obstetrician who becomes familiar with this procedure no longer dreads the posterior position, the bugbear of the practitioner.

DISCUSSION.

Dr. William M. Brown, Rochester, New York.—The Scanzoni method of taking care of these frequent occipitoposterior positions is a very useful procedure, and one that I am using more and more all the time. But there is just perhaps one place where Dr. Bill and I differ, in that he is inclined to do it a little earlier in the progress of labor than I would. I have found that a fairly good percentage of right posterior positions will rotate anteriorly if the flexion of the head is properly maintained. The lowest presenting part of the

child will almost invariably rotate anteriorly if the flexion is carefully maintained. If started right, a good many of these cases will promptly rotate. The rotation will go on very satisfactorily. We do get many of them arrested in the transverse, and we do have to help them, but there is one point I never could understand in the teaching of obstetrics. We have known a good many teachers who will tell us that in the right position or occipitoposterior we should put the patient in the right lateral position. That never has appealed to me as good physics. I have repeatedly taken a patient and turned her over on the left side because if there is anything that will aid flexion, it is to increase the angle, between the spine and the child's head. The spine is closer to the occiput in its attachment to the head; if you tip the patient over on the right side, how will you decrease the flexion of the head? If you turn her over on the left side you will increase the angle and aid in the flexion. I have repeatedly done it. Where I have had a case that was arrested in the transverse and no progress made for five or ten minutes in the left lateral position, I would turn the patient back and rotation would be accomplished very quickly, and that is one point that has helped me a good many times, although Scanzoni says that actual rotation with instruments is the thing to do in these persistent cases.

Dr. John Norval Bell, Detroit, Michigan.—I am much in accord with Dr. Bill in what he says about the Scanzoni maneuver in occipitoposterior positions. We must not, however, when we discover an occipitoposterior position, rush in and avail ourselves of the Scanzoni maneuver, because 80 per cent. of the cases will rotate if we leave them alone, but in the more persistent cases it is permissible to adopt that procedure.

There is one little point in technic that I have adopted, although I believe it is supposed to be the wrong thing to do. Maybe it is wrong when you overdo it, and that is, when the head is well engaged and traction has been made, just before attempting the Scanzoni maneuver, when you have made cephalic application of the forceps, very gently push the head back with the forceps locked on the head. The danger is in pushing it too far; you gently unlock the child's head so that there is a little bit of wabble. There is more room then and you can rotate the head nicely.

Another little point Dr. Bill brought out which is very important is that when you are rotating, there is an advantage in having the patient in the dorsal decubitus position well down to the end of the bed so that you have plenty of room to drop the handle down, keeping the blade in the axis of the parturient canal.

Dr. Louis Burckhardt, Indianapolis, Indiana.—Dr. Bill has answered the main point I wanted to make. In 80 per cent. of the cases with the right positions, what has been said holds true, and the history is that right occipital positions turn backward first and then forward, and it is wrong to speak about posterior presentations as being pathological. I can deliver a woman in a case of posterior presentation almost as well with forceps as I can in an anterior presentation. I can assure Dr. Brown that if he will put

the patient well on the edge of the bed and get a free field for the operation, take plenty of room to deliver the head, he will not do any more damage to the perineum than in a case of anterior presentation.

Many of the objections to right occipital or left occipital presentations that were raised are not to be considered as occipitoposterior, but as a consequence of parietoanterior or parietoposterior presentations on account of a slight change in the anteroposterior diameters.

Dr. Magnus A. Tate, Cincinnati, Ohio.—Occipitoposterior presentations, I am firmly convinced, are far more frequent than most of the text-books state.

I disagree with Dr. Bill when he said that most occipitoposterior positions will turn to the hollow of the sacrum, on the contrary most occipitoposterior positions will turn to the front in at least 75 to 80 per cent. of the cases.

Pituitrin should never be used with any abnormal presentation. The application of the forceps in occipitoposterior positions is a good procedure in the hands of a very skilled obstetrician, but it is very dangerous in the hands of one who is not. I have seen quite a number of cases of very bad laceration; also one case where the child has been rotated, instrumentally and the neck was broken. That case, of course, was not in the hands of one who was skilled in the manipulation of forceps.

I have delivered many women with forceps, and as a rule with very good results, but I believe very firmly, and my experience justifies me in making this statement, that with the hand I can do better work at rotating than I can with the forceps. I can feel with my hand. I know when I have the head flexed with my hand, and you cannot always tell when you have the head properly flexed when using the forceps.

In the cases where women have been in labor for hours and hours, the head itself is very edematous, with, as a rule, a large caput, and the vagina very dry and swollen. When you put on a pair of forceps, unless you are very careful in your manipulations, you are bound to do harm in these cases and that is the reason why I use my hand almost universally. You can take the child's head in your hand if you know how to do it, it is so easy to lift it up and turn it to the front and flex it. Then wait a few moments until Nature gets a chance to bring the perineum and vagina into good condition by being relieved of the intense pressure. You often find the perineum to be like parchment, and if you put the head above the brim and keep it there, not being in too great a hurry to deliver, letting blood circulate into the perineum, you will be surprised how easy you can deliver the woman, with little or no danger to the soft parts.

Dr. Irving W. Potter, Buffalo, New York.—I never have been so fortunate as the doctor in the use of forceps, and the cases that I have seen where forceps have been used damage has been very great, both immediate to the mother and remote to the child.

My procedure of choice in the management of these cases is not

with the forceps at all; I keep as far away from the use of instruments as I can, but I like very much to do podalic version. In this connection I want to cite a case I saw yesterday morning in consultation. A woman, thirty years of age, pregnant for the second time, had been in labor all Saturday and up to 11 o'clock Sunday morning, when I was called I found that the physician had been in attendance all that time, and upon examination found that the membranes had ruptured and amniotic fluid drained away. I found a persistent left occipitoposterior position. I put that woman on an ordinary kitchen table with her buttocks well to the edge of the table and legs supported by two assistants. Putting on a long rubber glove which extended to my elbow and using liquid soap as a lubricant (her physician gave her chloroform to the point of surgical anesthesia, so that she was perfectly relaxed), I raised the head through the pelvis and brought down both feet. I was very careful in doing that because I realized how thin the lower uterine segment gets after twelve hours of labor, and with my hand on the outside I pushed the head back and brought both feet down, terminating the labor by version and extraction.

In closing, I will say that to the physician who is thoroughly conversant with a properly performed version, these posterior cases will not be such a horror.

Dr. Jennings C. Litzenberg, Minneapolis.—Dr. Bill in his last sentence struck the keynote when he said if a man is sufficiently experienced, he will find it a satisfactory method to deliver occipitoposterior presentations. If one has had opportunity for learning the technic of delivering occipitoposterior positions with forceps, he is likely to agree with Dr. Bill. I think the gentlemen in discussing Dr. Bill's paper have missed the chief point he has made, and that is, a modified technic to avoid the principal dangers which attend the operation, namely, traction during rotation. That is the meat, it seems to me, of his paper; that that one modification in his hands and in the hands of one experienced reduces the danger of these high tears in the vagina, almost impossible. The question is largely a matter of experience. In the hands of the general practitioner or a bungling operator you will see the injuries that Dr. Potter has spoken of.

There is one point in which I would disagree with Dr. Bill, and that is, delivery of the occiput over the pelvic floor should never be done. In the hands of a man who does not know how to deal with an anterior rotation from an occiput posterior he will do less harm than with the Scanzoni maneuver. This maneuver is not simply a rotation of the head from the occipitoposterior position to an occipitoanterior, but is a circular swing of the handles of the forceps during rotation. It is the mastery of this particular technic together with the avoidance of traction during the rotation which Dr. Bill is emphasizing.

Dr. Arthur J. Skeel, Cleveland, Ohio.—I agree with the last speaker (Dr. Litzenberg) that the point of the paper is a modification of the technic. It makes no difference how successful a man

may be with the use of the forceps or what his experience has been, if he follows the classical methods described for rotating the head with traction, he will get injury of the vagina. Any competent man who, with a good light and retractors, inspects the vagina afterward, will find these injuries. These injuries occur in the mid-portion of the vagina and rarely involve the perineum. I think we should recognize that this is a distinct modification that Dr. Bill has advocated, and a definite point should be made of that fact.

Dr. Bill (closing).—There are one or two points I desire to take up in my closing remarks. In the first place, Dr. Tate misunderstood me. I did not say that in the majority of cases the head rotated to the hollow of the sacrum. I did say that in my experience in eleven or twelve cases the head rotated to the hollow of the sacrum and had to be rotated through an arc of 180°. That is not a common occurrence.

The point which Dr. Bell mentioned, of pushing the head up to a slightly higher level, is a rather important point. I never pull the head down in rotating it, but if it is fixed in the pelvis I push it up a little to free it before trying to turn. If you push it up a little and free it from impaction, it rotates easily. A noteworthy point about the procedure is the absence of force. We do away with force and rough manipulation. In the average case in which this procedure is carried out little or no force is used. Take, for instance, cases of multiparæ. If there is a posterior position in a multipara the head can be held up on account of that position and nothing else. If it were not for a faulty position the multipara might deliver the baby in a few minutes in the second stage; at the same time she goes on for several hours in the second stage. We rotate the head, and before we remove the forceps the head is on the perineum. After rotating the head we need to use very little traction in the delivery.

I cannot agree with Dr. Burckhardt that the head can be delivered as well in the posterior position as in the anterior position. We all know that a great amount of force is necessary and I would like to urge the elimination of force.

I can remember very well a typical case I saw in consultation in which two physicians had alternately pulled on the head. One pulled until he was tired, and then the other man pulled; the forceps slipped off and tore nearly through the perineum, and the head did not come down. I examined the woman and found the presentation to be a right posterior. Forceps were then applied and the head rotated after which it came down easily. The only thing that held it up was the posterior position. I never make traction upon the head while in the posterior position.

The mention of the name of Dr. De Lee brings up the point which I made in my talk of the unfortunate statements in text-books concerning this operation. De Lee condemns the operation, but De Lee also describes it as a simultaneous rotation and traction so as to bring about a spiral movement of the head during its descent. De Lee says emphatically never to rotate the head without traction. That is just the opposite of what I would urge; always rotate without traction and never rotate with traction.

DOCTOR JOHN BARD (1716–1799).

A SHORT BIOGRAPHY AND HISTORY OF HIS TIMES, WITH A UNIQUE CASE OF EXTRA-UTERINE FETUS CORRECTLY DIAGNOSED AND SUCCESSFULLY TREATED.

BY

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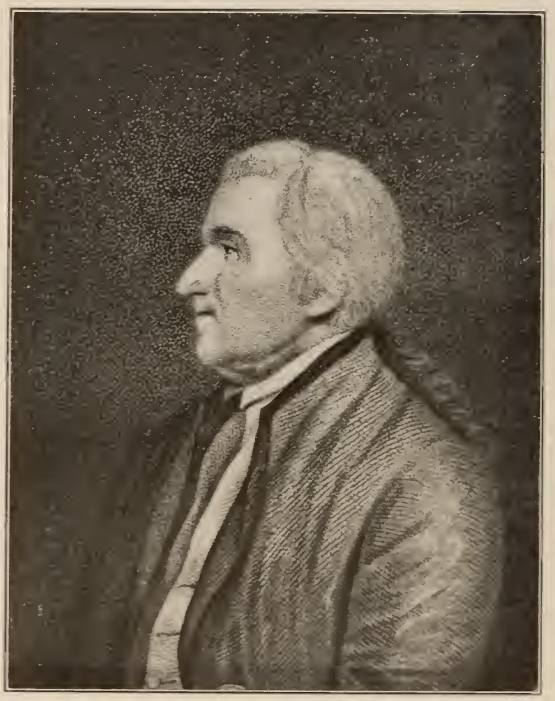
"We have great pleasure in presenting that class of our fellows whose declining years have lessened the number of their enjoyments with an appropriate gratification; the portrait of a physician who in his time was held in respect and esteem, who had useful talents exercised without vanity, but with benevolence and integrity."

We often speak of ancient history and of men and minds of olden times, but as the foundation stone is to the pinnacle, so is the work and life history of the older men in the profession to what we are to-day. If all that was discovered in the years gone by, the product of investigation and careful thought, were taken away, the present-day superstructure would fall; and we should have to begin over again with philosophy and idealism in order that the more material might be firmly founded, for the past is a part of the present.

To review in memory, to study the lives of the noted men of the past, to look into their surroundings and the conditions then existing, to see how their work was hampered and how their minds rose above convention and ignorance, is not only a pleasure, but profitable, and it seems wise for us occasionally to get out of ourselves, away from the present, and consider that which has made our work possible and profitable. The history of medicine is a graveyard of beliefs.

John Bard was born in Burlington, New Jersey, in 1716. "His father was a refugeé from the tyranny of Louis XIV, who first went to London and was sent thence by an uncle to this country on a mercantile enterprise; but this not being suited to his genius was therefore unsuccessful, so he abandoned this trade and retired to Burlington, where, having been appointed judge of the Supreme Court and one of the governor's council, he died at an early age, leaving a widow and seven children, with a very moderate income. She devoted herself to her family with so much good sense and pious zeal, that she lived to see them all respectably established."

"John Bard, her third son, was sent to Philadelphia, and introduced, for it could only be called an introduction, to the rudiments of a polite and classical education, under the best masters then to be procured. In one circumstance he was fortunate. His Latin teacher was a Scotch gentleman by the name of Annan, who, at the same time that his contracted circumstances compelled him to teach a grammar school for support, by his learning and his politeness



Doctor John Bard.

commanded the respect and enjoyed the society of the governor and principal gentlemen of that city. But Dr. Bard enjoyed the advantages of this situation only a very few years, and at the age of fourteen or fifteen, according to the custom of that day, was bound apprentice to a Mr. Kearsley, an English surgeon practising in Philadelphia, of good talents, but of so unhappy a temper that his presence banished cheerfulness from his family. He treated his pupils with great rigour and subjected them to the most menial employment, to which, Dr. Bard has often been heard to say he would never have submitted but from the apprehension of giving pain to his excellent mother and the encouragement he received from

the kindness of her particular friend, Mrs. Kearsley, of whom he always spoke in terms of the warmest gratitude, affection, and respect. Under such circumstances he persevered to the end of seven tedious years, stealing his hours of study from sleep after the family had retired to rest or before they arose from their beds in the morning."

We can see from this quotation, taken from a memoir written anonymously in 1814, what the life of a medical student was in these early days of our national history. In the Colonies there were no medical colleges. Education was primitive. A young man, before he could possibly know how his life would be arranged for him, was apprenticed to some physician for seven years. As might be expected, there existed at that time very few competent, educated, progressive men. The Colonies were full of quacks and charlatans; and, if in our own time we find a great discrepancy in the mental ability, application, and earnestness of purpose in the profession, certainly it was greatly accentuated at that time when physicians were neither licensed, examined, nor given diplomas.

"In medical practice, perhaps more than in any other science, we begin our studies thoughtless and undecided, following whatever is delightful, neglecting the more severe and useful parts; but, as we advance toward that period in which we are to enter upon a most difficult profession, and to take our place and station in life, and when we think of the hesitation, the anxiety, and apprehension with which we must move through the first years of practice, with regret we look back upon every moment that was lost, with a consciousness of many idle hours, and with an unavailing sense of much ill-directed and unprofitable labor."

Occasionally, a man of wealth took the long trip to Europe, generally to Edinburgh, where a true education might be obtained. On his return this man would stand high and become a leader. Around him would flock those who had not the same good fortune, and we are told that it was surprising to see how the older men, without jealousy or growth of ill-will, would stand beside the younger who had had the better opportunity.

The schools of to-day bring the greatest good to the greatest number, giving many minds an equal education, bringing all up to at least a condition of mediocrity, from which the brighter may more easily ascend; but when Bard was striving, only the industrious, the man who was stimulated to endeavor, was the man who succeeded, yet all through the past we have instances of bright men, clear minds, original ideas, in which we can discover a great deal

which sounds like to-day, but which is expressed in different vernacular. Does the advance of medicine in the twentieth century mean relief of the sick, or a matter of art alone?

Every man's office was then a medical college. Every preceptor was a teacher, and, according to the man's experience and profit by experience, did he obtain excellence. A most fortunate thing for John Bard was his apprenticeship to one who was cantankerous and severe, because an easy life seldom develops one's best abilities, and to be harrowed, plowed, and turned over day after day brings in time the biggest crop.

He who is careful in his choice of companions, who shuns those who are of lazy mind, enlarges an acquaintanceship or friendship among those who make the most of their opportunities; he who thinks deeply and broadly is the man bound to succeed. John Bard lived at the time of Benjamin Franklin, with whom he became well acquainted and who had considerable influence in the direction of his life work. In 1737, he started out for himself in Philadelphia. It is said his early days and practice were not very fruitful, but by 1740 he was able to marry the niece of his preceptor. In 1742 and 1743, two eminent New York surgeons, Drs. DuBois and Dupie, died, and Franklin suggested to Bard that if he went to New York he would have a larger field and better prospects. Bard took advantage of this advice, and immediately entered into the professional life of that city.

In 1742, there was born into his family, a son, Samuel Bard, who grew up with his father, became apprenticed, and eventually developed into one of the leading surgeons of his day in New York. He was the originator and founder of the first hospital in that city. He was a man of great talent, and although in those days there were no magazines in which to publish the results of his work, he wrote considerable.

In 1740, John Bard read a paper on "Malignant Pleurisy," an epidemic then raging in Huntington, Long Island. This was received with marked attention from the profession, and was published in an English periodical of that day. In 1750, he made the first dissection in the colonies. At this time, medicine was largely founded on anatomy. Sooner or later every physician became an expert anatomist. There was little else in medicine. Physiology was so slightly comprehended that we quote the following from John and Charles Bell's "Anatomy and Physiology of the Human Body," 1796: "In spite of feeling and reason, the student encourages in himself a taste for speculations and theories, the idle amusements

of the day, which, even in his own short course of study, he may observe in quick succession into neglect and oblivion, never to be revived. He aspires to the character of a physiologist, to which want of experience and a youthful fancy have assigned a rank and importance which it does not hold in the estimation of those who should best know its weakness and strength. The rawest student, proud of his physiological knowledge, boasts of a science and a name which is modestly disclaimed by the first anatomist, and the truest physiologist of this or any other age." Hunter speaks thus of his physiology and of his anatomical demonstrations: "Physiology, so far as it is known or has been explained by Haller, and the best of the moderns, may be easily acquired by a student without a master, provided the student is acquainted with philosophy and chemistry, and is an expert and ready anatomist, because with these qualifications he can read any physiological book and understand it as fast as he reads."

The charms of his conversation, his vivacity, and cheerfulness, which enlivened all gatherings wherever he went, rendered Bard's society peculiarly agreeable to persons of both sexes. He received the attention of the public, and as an epidemic of yellow fever had been raging in New York City, his writings and public utterances led to the formation of a quarantine at Bedloe's Island, and John Bard was made the first health officer of New York.

From the confined circumstances of his education Dr. Bard was neither classically nor professionally a learned man, but he possessed a lively fancy, a sound judgment, and a correct taste. He read with great delight the best authors, particularly the poets of his own language, and whatever he read and admired he made so completely his own, that he could recall it almost at pleasure to his memory, and would frequently surprise and delight his friends by long and appropriate quotations from authors he had not seen for many years. In his professional life he read all the best authors of his day, but his studies were rather select than general. Sydenham and Huxham were his favorites. He formed himself upon their plan, and was so familiar with their histories of diseases and their rules of practice, that he applied them with great ease and readiness, and acquired from them a correct and happy talent in discriminating diseases, and such sound principles of practice, as rendered his own eminently successful.

From his portrait one can see that he more or less blended two characters, and his whole life gave evidence that this was true. He had the forehead of a man of easy conversation; his nose was

one of charity and geniality, accentuated by a chin of the same indication; but his straight, compressed upper lip showed that he could be firm, determined, and persistent. A study of his life is that of a man socially inclined, congenial, urbane, and condescending; but in his professional life he was a student, true to the knowledge of the day, and a keen observer, accurate, concise, and punctilious in detail.

At that period medicine was separated into two branches: the highly philosophical and speculative, founded in ignorance as to the cause of disease, and closely linked to the religious trend of mind but recently handed down from the preceding century; and the inquisitive and observing side, which, unhampered by the laboratory, the paths of least resistance so common these days, developed powers of observation and aroused memories which led to keen, accurate diagnoses and excellent prognostics. Naturally, a wide diversion existed between the speculations as to the causes of disease conditions and the beautiful descriptions of disease symptomatology.

"It was from these reflections that Dr. Sydenham used to say he thought it as much incumbent upon a physician to read nature as to read books. And Sir William Temple, convinced of these truths, queried whether the general practice of physic, as it was in all hands, had done more good or harm to mankind. From the whole, it necessarily follows, that though the art of physic and surgery, under a judicious direction, must derive great advantages to society, yet these arts, in the hands of the rash and unskillful, too often occasion the most fatal mischief, as errors of this kind are errors of the most dangerous consequence."

It was in 1759 that Bard had a case of extra-uterine fetus, which he described in a letter to Dr. John Fothergill, and which was by him communicated to the Society of Physicians in London, read March 24, 1760, and published in *Medical Observations and Inquiries*, vol. ii, as follows:

"Sir Dr. Colding, sometime ago, showed me a letter he was favored with from you wherein you acquainted him with the design of publishing the London Medical Essays, and invited him to encourage that work by communicating any useful or curious observations, which might fall under his notice in this part of the world. Encouraged by this invitation to the doctor, whom I have the honor to be intimate with, I have taken the freedom though a stranger, to send you the history of a case which has lately fallen under my care:

"Mrs. S., the wife of a mason, about twenty-eight years of age, having one child without any uncommon symptoms, either during

her pregnancy or labor, became, as she imagined, a second time pregnant. She was more disordered in this than in her former pregnancy, frequently feverish, the swelling of her belly not so equal, nor the motion of the child so strong and lively. At the end of nine months, when she expected her delivery, she had some labor pains, but without a flow of waters, or any other discharge. The pains soon went off, and the swelling in her belly became gradually less, but there still remained a large, indolent, movable tumor, inclining a little to the right side. She had a return of her menses, continued regular five months, conceived again, and enjoyed better health; the swelling of her belly became more equal and uniform, and, at the end of nine months, after a short and easy labor, she was delivered of a healthy child, the tumor on the right side had again the same appearance as before her last pregnancy. Five days after delivery, she was seized with a violent fever, a purging, suppression of the lochia, pain in the tumor, and profuse fetid sweats. By careful treatment, these threatening symptoms were, in some measure, removed; but still there remained a loss of appetite, slow hectic fever, night sweats, and a diarrhea. To the tumor, which continued painful, and gradually increasing, were applied fomentations, and emollient poultices; and, at the end of nine weeks, I perceived so evident a fluctuation of matter in it, that I desired Dr. Huck, physician to the army, to visit this patient with me, and be present at the opening of it. From the whole history we concluded that we should find an extra-uterine fetus. I made an opening in the most prominent part of the tumor, about the middle of the right rectus muscle, beginning as high as the navel, and carrying it downward. There issued a vast quantity of extremely fetid matter, together with the third phalanx of a finger of a child. Introducing my finger into the abscess I found an opening into the cavity of the abdomen, by the side of the rectus muscle, through which I felt the child's elbow. I then directed my incision obliquely downward to the right ilium, and extracted a fetus of the common size at the ordinary time of delivery. The frontal, parietal, and occipital bones, and also the third phalanges of the fingers of one hand separated by putrefaction, remained behind, which I also took out. We imagined the placenta and funis umbilicalis were dissolved into pus, of which there was a great quantity. By the use of fomentations and detersive injections, while the discharge was copious, fetid, and offensive, and by the applications of proper bandages, and dressing with dry lint only, when the pus was laudable, the cavity contracted, filled up, and was cicatrized in ten weeks. The source of the hectic being removed, with the help of the bark elix. of citriol, and a proper diet, she quickly recovered good health. Her milk, which had left her from the time she was first seized with the fever, returned in great plenty after the abscess was healed, and she now suckles a healthy infant."

N. Y., Dec. 25, 1759.

I am, Sir,
With great respect,
Your humble servant,
JOHN BARD.

Doctor Bard's diagnosis is to be commended because of the infrequency of the ectopic state, particularly in small communities. In fact, few men have the chance of seeing many cases advanced to this stage, even in large practices.

John and Charles Bell state, "It would appear from the result of several cases that at the expiration of the natural termination of uterine gestation the fetus indicates that it is governed by prescribed laws which render a change necessary and show that its system no longer is fit to be supplied through the placental vessels. In the situation of the extra-uterine fetus this change cannot take place and becomes with its secundines as a load of foreign or dead matter in the body. This event is generally followed by the death of the mother, or the formation of an abscess which has opened and discharged the fetus."

Curiously, in the case mentioned, the fetus became encapsulated, did not become infected, and remained quiescent while a subsequent pregnancy went through its usual term successfully, then to be followed by infection. We can but commend a mind and mental powers of one who in those days of incomplete education and lack of association with many trained men, could diagnosticate and properly carry to a successful issue a case of this kind.

John Bard died in 1799 at his country estate in Dutchess County, New York. He was a great man, a noted surgeon, a public-spirited citizen. His prominence was due not to education, but to association, industrious application of all his talents, a sane recognition of the importance of a study of nature as well as of general literature and a firm belief that the patient should receive as careful attention as the disease. Much as he delighted in the speculations of the day, his mind was not warped, for he observed in detail, and was thus led to correct diagnosis and competent treatment.

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DISCUSSION.

Commander William Seaman Bainbridge, New York City.—I think a study of some of these old characters is not only interesting, but inspiring and instructive.

In 1914 and 1915 war surgery largely dealt with terrific infections of wounds. The loss of life and limb was appalling. Gradually new methods for combating these conditions were devised and step by step progress was made. During the last year and a half, the "débridement" treatment has been introduced—cutting away the brutalized tissues and then immediate suture. This has been heralded as a great advance. But if we look back we will find that Ambrose Paré, in the sixteenth century foreshadowed all this, and that this is not a new discovery, but a rediscovery. If we study the life of Baron Larrey we will find much that is applicable to-day.

Speaking of Ambrose Paré we find something that should never be forgotten by any of us. His advice is worthy of emulation as long as medicine and surgery are in practice. An important case of his, the Marquis Auret, a friend of the king, Charles IX, had a bad gunshot wound of the thigh and femur; bed sores; septic; given up. A model of Paré's treatment is as follows:

1. Gave hope of help.
2. Opened up sinuses.
3. Clean bed and linen.
4. Strong broths.
5. Plenty of sleep—new bed and properly applied pillows achieved it, no pressure on sores.
6. Cheered up—musician and conundrums.
7. Air—on cot out of doors.

He did not see how the patient could recover. He tells us—"All things considered, it did not seem to me that the Marquis could possibly recover from such a combination of bodily ills. Nevertheless, to give him some encouragement, for he was very low in spirits, I told him that, with the aid of God and the assistance of his regular medical attendants, I would soon have him on his feet. Then I took a walk through the garden and prayed to God that he would bless the plan of treatment that I was about to adopt, and crown these efforts with a cure." Before the family and friends Paré talked over the case and treatment, and stated surprise that an operation had not been done before; the doctors explained that the patient did not allow it. Paré said, "I dress his wound, but God causes it to heal."

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I want to heartily endorse what has been said in regard to the charming and inspiring paper presented by Dr. Dickinson and to supplement it by saying that I think it was Larray who gave what was then the modern treatment after amputations upon the battlefield, namely, he poured alcohol or tannic acid in the form of red wine on the wound and closed it up.

A STUDY OF VARIOUS CASES OF PREGNANCY TOXEMIA.

BY

GEORGE CLARK MOSHER, A. M., M. D., F. A. C. S.,

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During the winter and spring of 1918 the writer has had under observation thirty-two cases of preëclamptic toxemia or eclampsia. Since May, 1917, forty-nine cases have been under treatment, including six cases of pernicious vomiting.

Why there should be in the six weeks from January 1 to February 15, 1918, as many such cases as would ordinarily be met in a year is a mystery. One cannot account for the frequency of toxemia except by charging it either to the extreme changes in temperature from a bitter cold to mild weather, and back again, just as epidemic jaundice or herpes zoster has in some seasons been ascribed to climatic conditions; or else to the nervous unrest and tension from which every sensitive woman suffers on account of our entrance into the war. Nearly every family has some of its younger men in the service, and even those families that are not represented, are living under such abnormal conditions that resistance is easily overcome; and if the patient has a tendency to be under par, she loses her equilibrium of absorption and elimination.

The insufficient elimination of toxins generated at the placental site and by the fetus, together with the extra burden thrown on the organism of the mother to provide for oxygenation for herself and the developing child, become greatly increased, owing to extreme cold weather, because of the loss of equilibrium between the surface of the body and the heat centers. This may interfere with the metabolism to such a degree as to produce an acidosis as is claimed by Martin Fischer in his argument showing the relation between edema and acidosis. Nervous strain, moreover, produces fatigue, insomnia, and faulty metabolism.

Eclampsia, which still claims a death rate of 25 to 40 per cent. by

the average statistics, was long ago designated by Zweifel as the disease of theories. We have not been able up to the present day to reach a basis where we could absolutely prove its origin or trace its etiology. The signs and symptoms are, of course, familiar; and the findings at autopsy—liver, kidney, and brain necrosis—all have seen. From these facts, we gain the clue upon which our plan of treatment is founded; but while experimental evidence and grouped phenomena are helpful, every man draws his own conclusions from the cases he has seen and applies them according to his own mode of reasoning, which may be a temporary theory or may become an obsession.

As witness of the statement that toxemia is yet not without the bounds of theory, one's attention is called to a valuable article on "Treatment of Eclampsia" by Dr. J. Clifton Edgar in the *Journal of the American Medical Association* of April 27, 1918. Dr. Edgar says: "A one time advocate of active medical and surgical treatment, and bitterly opposed to morphine in eclampsia, experiences in the last five years have radically changed my views and teaching. But I also am still uncertain whether morphine increases infant mortality." And also, "A one time enthusiast in the free use of veratrum viride in eclampsia, I frankly confess to having changed my views. I fear its shock-producing effect, although I still occasionally employ it in small doses in selected cases." In other respects Edgar's treatment varies but little from our own established technic.

A paper by D. M. Erwin of the Department of Pathology, University of Cincinnati, contains the results of some striking research work in regard to the relation of blood pressure to convulsions (*J. A. M. A.*, April 27, 1918). He contends that: "The chemical substance in the blood only produces edema. The height of the blood pressure over the intracranial is the margin of safety. When this margin is at a small positive quantity, the brain must undergo some change. The vasomotor center fags. As a consequence, the blood pressure, which has been maintained as high as possible, drops. The intracranial pressure now becomes greater than the blood pressure; the margin is negative; the pupils dilate and convulsion comes on; the sharp tense contractions of the muscles play a vicarious part by forcing the blood pressure to the periphery and raising that in the brain until the margin is again positive. With this renewed blood supply the centers again take up, for the time, their work."

Knowing that next to sepsis, eclampsia is the most deadly of all obstetric complications, every woman has, on coming under our

observation, been examined with the realization that her symptoms may possibly suggest at any time that she is a preëclamptic. As soon as her pregnancy is recognized, blood pressure, eye symptoms, and urinalysis are made a routine; the teeth and tonsils inspected for foci of possible infection.

The etiology of eclampsia as formulated into a table of relative values is as follows:

1. Failure of elimination of toxins. These in the early months are doubtless due to the placenta, and in the second half of pregnancy doubtless to the excretions of the fetus.

2. Infections of various types throw a burden on the pregnant woman.

3. Resulting from pressure and from stasis with a decrease of normal power of maternal oxygenation, thus interfering with lung expansion, and with the action of the heart we have an asphyxia of greater or less degree. LaVake has pictured a woman pregnant who has thus thrown on the excretory organs a double load.

The patient who has had a previous scarlet fever or some similar disease, is handicapped in elimination of bacteria or their toxins, which emanate from such foci as infected tonsils, or teeth, or from colon bacillus. These may further damage her resistance.

The basic feature of the etiology is a source from the placenta or the fetus. The degree of overwhelming by the toxins is dependable on two conditions; first, rapidity of the generation of the toxins; and second, the compensatory ability shown by the organs of elimination to throw off the poison.

Beyond question there are depressing effects from the presence of the toxin shown by the lesions in kidney, liver, and heart. These add to the risk of the pregnant woman.

The fetus makes still heavier demands on the powers of oxygenation of the mother in the later months of pregnancy; and even though reduced by the stasis of the abdominal organs resulting from pressure through the diaphragm this demand is followed by decreased expansion of the lungs and an interference with the cardiac rhythm. This causes a maternal asphyxia of a mild type which again lessens resistance and increases the damage to kidneys and liver. Pyorrhea or pyorrhea alveolaris should place the attendant on his guard against his patient's developing a later toxemia.

A case of eclampsia will always demonstrate some focus of infection before it develops; and that case even under careful observation up to the week of delivery should show no signs but the trace of albumin, higher blood pressure, and nervous manifestations.

Then other cases with temperature manifested before any examination or interference has been done, are in still a third class, usually multiparæ, a number of cases which develop toxemia after having had previous normal pregnancy and labor with a definite history of infection since the last labor. The bowels should move once daily. This removes excretory products, bacteria, and toxins from the system, relieving stress on the kidneys and saving injury to the intestine, which would result from large hardened masses of feces, which try to pass the unusual obstruction, and from pressure, and thus result in infection of the blood stream.

The hematogenous kidney, which has been accurately diagnosticated and successfully treated by surgical procedure by Dr. Howard Hill, is ample evidence that colon bacilli do gain access to the blood stream, and cause infection of the kidney, through infarcts in its deep structure. Pressure effects on the bowel also disturb the normal balance of bacterial growth and result in the development of products particularly toxic in nature. Six to eight glasses of water and milk should be taken. These toxemic patients fare better by eating only one meal a day. Exercise and massage to promote general circulation are endorsed. Hemoglobin should be estimated, and iron given in the food or in the form of Blaud's mass, if needed. The urine should be examined during the first six months, once a month; during the last three months, twice a month. If any symptoms arise, examination should be made daily. The patient is always instructed to notify her attending physician if any danger signals, such as unilateral headache, edema, disturbed vision, epigastric pain, or nausea should appear.

The asphyxia raises the blood pressure of the adrenal glands; and as a consequence, an extra amount of adrenalin is thrown into the blood stream. In consequence of the concentration, acidosis from the increase of acidity results. Associated with this asphyxia and output of adrenalin is the increase in the rise of blood pressure and increased coagulability of the blood. These always occur in eclampsia in the later months.

Accepting a rational theory of the production of eclampsia, we have tried to standardize our plan of prophylaxis and treatment as follows:

1. Diet which shall be of nonirritating food.

2. Elimination encouraged by kidney, bowels, and skin. Intake and output of fluids is a most important routine and must be shown in a daily consolidated report.

3. All foci of possible infection, tonsils, teeth, kidneys, and bowels, should be discovered and eradicated.

4. Deep breathing by aids to general circulation and by fresh air avoids danger of asphyxia.

5. Free exhibition of alkali-salts and food anticipates acidosis.

6. Veratrum viride by a system devised to lower blood pressure, reduce the pulse, and aid diaphoresis.

7. The emptying of the uterus, as a therapeutic measure, to be done in the way least conducive to shock is indicated as soon as prophylactic measures fail. Every one at all familiar with the toxemia of pregnancy recognizes the marked improvement of the patient's condition following the removal of the products of conception.

In a most illuminating paper on toxemia, J. Young (*Journal Obst. and Gyn. of the British Empire*, July, 1914), claims that hemorrhages or areas of necrosis in the placenta depend on whether vein or artery is affected, and that these result from thromboses in the ovarian and uterine vessels. Toxins are generated in the autolyses of these areas and these Young holds responsible for the toxemia. This theory placed side by side with that of the infectious origin of eclampsia recalls the relation of thrombosis and infection, and also the high percentage of toxemia of pregnancy and accidental hemorrhage where a focus of infection may actually be demonstrated.

Young shows that toxemias are due to the liberation of products of early autolysis of placenta because they are associated with recent infarcts of the placenta, which is so constructed that the dying toxins pass directly into the blood stream.

Experimentally, he isolated from the healthy placenta soluble materials which, when injected, caused convulsions and focal necrosis of the liver, and degeneration of the kidneys.

Most eclampsias occur in primiparæ in hydramnios and in multiple pregnancy. These patients are, of course, subject to the greatest pressure and most frequently suffer from asphyxia.

It is to be remembered that in chloroform poisoning and the lesions from certain types of eclampsia, the liver and kidneys are identically involved. From this experimental discovery of Arthur Dean Bevan, which was shown in an address given before the Jackson County Medical Society at the Kansas City General Hospital in 1913, we conclude that chloroform and eclampsia produce identical injuries, and that chloroform, therefore, adds to the danger of the eclampsia and should never be used as an anesthetic in these cases. The fact that the asphyxia from chloroform circulating in the blood increases

the lesion suggests that the diet which protects the liver cell in chloroform poisoning should be one generous in carbohydrates and correspondingly low in fats and proteid.

The identity of the kidney lesion of sepsis and eclampsia has long been observed. Martin Fischer in his work on edema and acidosis advises the giving of salts which best overcome edema, as acidosis is quite frequent.

In eclampsia, we can see why magnesium sulphate is so often resorted to and can understand the reason for its happy results in these cases.

That eclampsia may be due to edema of the brain is the contention of Zangenmeister in writing on edema. In view of the relation of focal infection to eclampsia and preëclamptic toxemia, great stress should be placed on the locating of all foci of possible infection.

The teeth especially should be examined, and these patients should be advised to consult their dentists throughout pregnancy and be under his care. All visible signs of focal infection and destruction must be treated

If a patient has a history of rheumatism or muscular pains, teeth in which nerves have been killed should be *x*-rayed. Teeth which have been crowned are especially under suspicion. The teeth involved should be removed when symptoms of local systemic absorption are observed. To avoid the severe auto-vaccination resulting from the removal, the teeth should be extracted one at a time. All these measures constitute prophylaxis and may prevent toxemia, hemorrhage, and abortion.

Since sepsis is found to produce nephritis in the woman not pregnant, how much more likely it is to result in the pregnant patient?

The routine treatment of this group of cases has been milk diet or whey, cereal, sugar and buttermilk, sulphate of magnesia until copious results appear, elimination by liberal quantities of water, rest in bed, and means of inducing sleep in the preëclamptic subjects.

Blood pressure and eye symptoms, together with intake and output of liquids, are carefully watched and recorded, the latter summed up in twenty-four hours' contrast. If the blood pressure has been persistently over 150, the advent of eclampsia should be expected; and if rapid pulse and headache are also in evidence and the pressure remains at 180, the uterus was emptied. The double benefit of this maneuver is that it not only relieves pressure, but it also immediately provides for the oxygenation of the child by its own mechanism. A method which will cause the least shock to the nervous system and do

least damage to the soft structures of the pelvis should be selected. In general, this method is the Voorhees bag inserted after gradual preliminary dilatation by Hegar's dilators up to No. 20, which admits the No. 4 bag, rather than by digital dilatation. We have found these patients peculiarly susceptible to sepsis and if forcible manual dilatation is resorted to, the cervix being torn, not only is the resulting scar an evidence of wreckage of structure, but immediately the parts of the cervix, hanging into the vagina, invite septic infection from the outside and greatly increase the mortality.

Unless these patients die from the results of necrosis of liver or brain, the fatality is usually from sepsis. In fact, one of the two deaths in the recent series was due to infection, the patient having been delivered before coming into the hospital. The first seizure took place one-half hour postpartum. Death followed from general peritonitis and myocarditis.

In the Chicago Lying-In Hospital, the use of hot packs has been abandoned by Dr. DeLee; but we still are using the electric pack, where a dry hot skin with blood pressure of 180 or over indicates the approach of convulsions. Solution of soda bicarbonate by mouth or by proctoclysis is depended on as the fluid to preserve an equilibrium between intake and output. All our patients were given ether; in no case was chloroform allowed. Chloral by rectum, as a routine sedative was ordered, as it does not produce poisoning, as does chloroform, contrary to the assertion of some investigators. While an occasional dose of morphine $\frac{1}{8}$ and scopolamin $\frac{1}{200}$ is given, we do not use the Stroganoff method. LaVake asks the pertinent question why it is not a prophylactic against eclampsia, sepsis, miscarriage, and accidental hemorrhage in the pregnant women? He asserts that he has not seen a case of eclampsia in which a focus of infection and usually a marked one could not be demonstrated.

Krause of El Paso, in a paper before the Jackson County (Mo.) Medical Society, claims that in all the six eclamptic subjects he has conducted postmortems, the presence of the colon bacillus in the kidney was proved; and he associates eclampsia with colon infections, a suggestion to which his laboratory findings give evidence in his experience.

Hopkins Gardner (Amer. Jour. Obst., vol. lxv, no. i, 1912) conducted experiments which exclusively dispose of the statement that chloral produces the same liver necrosis as chloroform. He demonstrated also the fact that chloral hydrate produces no histologic

kidney lesion. We have discarded all anesthetics in the convulsion.

Oxygen in the convulsion has been used as an aid to overcoming asphyxia. No violent efforts should be made to restrain the patient. Magnesium sulphate to free catharsis; veratrum to keep pulse under 80. If the patient is conscious, give chloral, 20 grains, and bromide, 40 grains, by mouth; otherwise by enema, chloral, 30 grains, bromide, 60 grains. Murphy drip, soda bicarbonate, 2 per cent., glucose, 6 per cent., should be ordered. If this is rejected, soda solution by hypodermoclysis, care being exercised to have it sterile. Alternate every eight hours, high colon irrigation and the hot pack, the latter only if patient is absorbing plenty of fluids.

When all other means fail to free the system of toxins, we consider the emptying of the uterus as suggested. No bleeding is done, as it has been found that phlebotomy is no advantage to the average patient. One cannot tell how much blood the patient will lose at delivery. Blood pressure is more effectively relieved by veratrum ♏v–xv, every four hours for pulse over 100, and ♏iii for pulse over 80 and under 100. Cases not bled recover more rapidly than those bled. Bleeding has done harm; veratrum has never been found dangerous in our experience.

With a dilated right heart, beginning edema of the lungs, and high blood pressure, bleeding is certainly indicated. If these symptoms are absent, it is not.

As against the Stroganoff method of large doses of morphine, we find emptying the uterus safer. An initial dose of morphine lessens excitement and may be used. When it is employed to slow respiration, morphine increases asphyxia and the danger to the patient in consequence. However, Stroganoff has some very wonderful and attractive statistics in favor of his treatment. Dr. E. G. Zinke of Cincinnati, has long been a champion, with Hirst, of the conservative handling of eclampsia, discouraging the emptying of the uterus as meddlesome midwifery. Our results, however, we believe, justify us in our technic.

There is one class of cases which are peculiarly dangerous, and in which it must be recognized that the induction of labor or any waiting policy is not to be trusted. This is the fulminating type in primiparæ where one convulsion follows another in rapid succession. If in these patients the cervix is hard and long, the severe effects of continued pounding labor must force the toxins into the blood stream so violently that the resistance is broken down through the accession of the toxemia, and the patient will probably die

if she goes over three or four hours. In case the cervix is not softened, the delivery in this case should be by Cesarean section.

Our duty to these women is twofold. First, we want to spare their lives; and second, the dictates of the Catholic Church as well as those of humanity appeal to us to spare the lives of the unborn children as well as of the mothers who are imperiled by the overwhelming storm of toxic material which so rapidly menaces both victims.

Now, having decided to empty the uterus, we have reached the following conclusions as to method. The Voorhees bag is introduced by a routine technic. We find this means of dilatation less likely than any other procedure to injure the soft structures of the patient or to be followed by shock or sepsis.

If the cervix is not softened, we must choose, on the one hand, between *accouchement forcé*, a dangerous expedient producing shock and laceration and inviting infection, and on the other, a Cesarean section with the added risks involved by the hysterectomy which are by no means inconsiderable. In 1916, Dr. Franklin S. Newell of Boston, recorded the results of 100 Cesarean sections within 40 miles of Boston, not from published reports, but from private information; and the startling discovery is laid bare that where patients have been subjected to repeated examination and frequently ineffectual attempts have been made to use forceps and to do version, when this treatment is followed by section, the mortality is practically 100 per cent. It is, no doubt, from such figures that Rudolph Holmes has grounds for his warning against indiscriminate Cesarean section as a last resort. It has its place as a selected procedure in certain identified cases of eclampsia, but even they are limited.

The Voorhees bag introduced by the method mentioned has seldom failed to do the work. We have never had a rupture of the membranes from it nor have we had a resultant sepsis. The choice of method must, of course, be determined by the condition of the patient and the experience of the operator.

Prophylaxis and early treatment are the keynotes of success. If the patient is under observation early, it is believed that brain and liver necrosis, infarcts of kidney, and dangerous sequelæ of toxemia may usually be avoided. A diet of milk, cereals and fruits should be ordered. Full movements of the bowels are to be encouraged by 1 ounce magnesium sulphate and six to ten glasses water, daily.

If symptoms persist, we advise keeping patient in a well-ventilated

room with sunshine. She is directed to change her position, lying, sitting, prone, lateral, and knee chest, using calisthenics and massage for exercise. The dental treatment should be continued at home, if necessary. As a diuretic, imperial drink may be ordered; cream of tartar, dr. 3, milk sugar, dr. 4, lemon juice, 1 ounce, dissolved in 3 pints of boiling water. This should be given if water becomes distasteful. If patient tires of milk, she may have cereal, whey, and sugar diet with buttermilk. The object of this plan is to give a high carbohydrate diet with low fat and just enough proteid to balance and sustain nitrogen equilibrium.

According to experimental research by Opie and Alford, carbohydrates have a favorable influence on pathologic states both from toxemia and chloroform poisoning. Fats have a bad effect, as also has proteid. Wash out bowel daily with 2 per cent. soda bicarbonate solution in the knee-chest position; assure plenty of sleep. When the blood pressure, which should be always observed and recorded, remains over 160, the patient is in danger. If it remains over 180 for even a limited period, she is menaced; and at 200 she should be delivered at once.

The albumin index is to be watched and the test-tubes kept in series so that the percentage can be noted daily. If the heat and acid test shows 40 per cent., the condition is considered critical. If it is 85 per cent. when first seen the uterus must be emptied in twenty-four hours, tentative treatment with magnesium sulphate and fluids being tried, if pulse stays over 90 and pressure over 160. It is always to be borne in mind that these patients are peculiarly prone to sepsis, and that the danger of interference is to be considered. Of course, eye disturbances and heart changes are also positive indications.

The patient with eclampsia two months before her time is liable to die if the symptoms do not clear up after prophylactic measures; and she should always be in the hospital and under close observation.

Concerning toxemic vomiting of pregnancy, six cases have been under treatment. It is a melancholy picture that confronts one on looking back to the old empiric plan, or lack of plan, by which these unfortunate subjects were managed. The lighter type finally came through, while the more profoundly poisoned victim either had to submit to therapeutic abortion or wait for a fatal termination. To Dr. John C. Hirst is due the credit for bringing to the profession the suggestion of corpus luteum in pernicious vomiting.

The following typical cases are presented herewith for discussion:

Case I.—Mrs. T., wife of a mining engineer of Bartlesville, Okla., had twice before been a patient of the writer. Each time it was thought necessary to empty the uterus after an ineffectual trial of means at hand to relieve her condition by less drastic measures. Being especially eager for a child, Mrs. T. came to the hospital last summer and was put to bed for the month in the second month of her pregnancy just as the nausea and vomiting were becoming intolerable. She was given a drachm bromide of soda and 30 grains of chloral by enema to quiet the nervous excitement. Afterward this dose was reduced to 40 grains of bromide and 20 grains of the chloral, p.r.n. was continued.

Corpus luteum extract was given by hypodermic ⅓ c.c. on alternate days, with ⅕ c.c. thyroid extract on the succeeding day. This dose was increased to ½ c.c. of the corpus luteum, and as the effect of the thyroid or her pulse indicated, the latter hypodermic was abandoned. After two weeks the vomiting ceased and the patient returned home. She went through an uneventful pregnancy, came back to the hospital, was delivered at term of a perfectly normal baby boy, and made a good recovery.

Case II.—Mrs. C. from Englewood had been in a hospital for three weeks. She had been given morphine and other sedatives unavailingly, and returned home. Her mother, who had been a patient of the writer in her own lying-in days, brought her to the office, and it was decided to put her on the corpus luteum régime. When she was admitted to the hospital the only substance which was retained at the time was "soda pop," of which she consumed many bottles. Many times this was rejected, but no food or other drink was retained even for an instant. In two weeks after the corpus luteum and thyroid was begun she returned home, and was delivered at term. She is now apparently well.

Two cases at the General Hospital followed the same history, with equal results. Each cleared up after two weeks in bed with corpus luteum.

Case III.—On March 12, 1918, Mrs. L. of Okmulgee, Okla., came into the hospital. Her history as to previous pregnancy showed that she had been delivered of a girl baby ten years ago after a stormy experience, the vomiting at times threatening to overwhelm her. Twice subsequently, under the care of two different medical attendants, she was relieved by therapeutic abortion which cleared up the symptoms.

The present pregnancy began in a storm of nausea from which the patient had no relief. She was in bed for four months, coming to the hospital on a stretcher thoroughly exhausted. She was unable to raise her head from the pillow. Vomiting was continuous, and some pain was felt, which had caused such alarm that a doctor was called to the train at Vinita and a hypodermic injection of morphine was administered.

Her blood pressure was 115 and some edema was found when she was admitted. The urine was loaded with casts and albumin, and blood persisted in each specimen for the first week. Under a

restricted diet, absolute rest in bed, corpus luteum and thyroid extract, bromide and chloral by enema to quiet nervous excitement, the patient gradually improved until she was able to eat what she desired, and strong enough to leave her bed. She left the hospital and remained at the Muehlebach Hotel until her accouchement in May. Mother and seven pound daughter returned home in June and are reported as doing well at this time.

Case IV.—Mrs. B. of Kansas City, Kansas, was referred for treatment after a month in bed under ordinary methods of drug therapy. Owing to an aggravated insomnia and extreme nervous condition, it was difficult to accomplish results during two weeks. The dose of corpus luteum was increased from one-half an ampoule on alternate days to three doses a day of 1 c.c. each. By the third week, relief was very noticeable, and the patient left the hospital at the end of a month. She was able to retain food and was not disturbed by nausea or vomiting. Her medical attendant informs me she is now apparently going through a normal pregnancy all toxic symptoms having subsided.

This remarkable series of cases while only six in number, is all that have been met in the past year; so it shows 100 per cent. of success. Of course, one admits it may have been through good fortune that these results were obtained, but one must remember that they included the cases in series; and what is of more importance, in two of them abortion had been done twice before because it was feared that the life of the patient was in grave jeopardy.

Some better plan may be devised for treating this type of toxemia; but up to the present it is certain that none has produced in the hands of the writer such signal success in results. Cases of pre-ëclamptic toxemia and eclampsia are the following:

Case I.—Mrs. O., a para-i, aged thirty-two, wife of an army captain, was seen in consultation with Dr. Lothian at 5.30 p. m. January 1. She came from Camp Doniphan, where she had been under treatment which was unsatisfactory, because of the lack of laboratory facilities and proper food, as well as hygienic means to combat the toxemia. On entering the hospital the patient presented a pathetic picture; she was semiconscious and suffering from general edema which had invaded the larynx and the glottis and caused a whistling breathing resembling that of a child with croup; amblyopia, unilateral headache, epigastric pain, nuchal pain, blood pressure 240 mm. of Hg., pulse 122, urine loaded with albumin, hyaline and granular casts, scanty, and of high specific gravity.

After salines the bowels were emptied and the blood pressure was reduced by veratrum viride ♏x to 186 and the pulse to 96. She had a comparatively quiet night, and gradually improved for ten days; but on January 2d, her urine showed albumin 4+, but neither hyalin nor granular casts. Blood pressure went up to 200 and pulse to 102. Veratrum ♏x was followed by a drop in the pulse to 86 and in the blood pressure to 178. No headache, but patient was perspiring profusely. At 9 p. m., another ♏x of veratrum was given and the blood pressure recorded was 122 and pulse 68.

The Voorhees bag was introduced at 6.30 A. M. January 13, and pains began at 10.30. The cough from the edema of the glottis returned, and the patient resumed retching and vomiting and became very restless. Veratrum ♏x was given and the recorded blood pressure 132. At 12.40 noon the blood pressure was again 196, and at 2.30 veratrum ♏x was followed by blood pressure of 150. Pains every three minutes and lasting thirty seconds. The bag was expelled at 2.50. At 3.10 a hypodermic of morphine sulphate $\frac{1}{8}$, and scopolamin $\frac{1}{200}$ was given and at 3.35 the recorded blood pressure was 138. She was delivered at 4.52 when the blood pressure was 150, pulse 66, fetal heart 152.

The placental delivery was slow, as it often is in these cases, and expulsion occurred after $\frac{1}{2}$ c.c. of pituitrin at 8.45 P. M. The pulse remained slow, and the perspiration very profuse, as it is often observed after ether. The baby, which weighed $5\frac{3}{4}$ pounds, and was at the seventh month, was kept alive by the breast milk of other mothers in the hospital, but finally expired in the third week, evidently from the effects of maternal toxemia which it could not throw off. Vision gradually was regained and Mrs. O. could distinguish persons and colors after the tenth day. The blood pressure fluctuated between 130 and 180, pulse averaged 90, and respiration 20. She left the hospital February 6. On March 30, Mrs. O. called at the office and requested permission to return to Camp Doniphan to remain until her husband should start overseas. Vision was good, no headache nor other disturbances. May 5, Mrs. O. was apparently well, blood pressure normal, urine negative.

Case II.—The wife of Dr. P., aged twenty-six para-i, had been under observation throughout her pregnancy. At various times albumin and casts appeared, with eye symptoms, epigastric pain, general edema, unilateral headache, and all the classical indications of eclampsia; but at no time over two of these appeared simultaneously; and at no time was there any rise of blood pressure over 130. She readily responded to restricted diet and fluids. On each Sunday the bars were down, but the six days diet was rigidly observed. Her delivery was uneventful, and no toxic symptoms have appeared since her return home. The daughter is a healthy specimen, now six months old.

Case III.—Mrs. N. C. came from Toledo, Ohio, and was seen in consultation with Dr. Buford G. Hamilton, on February 10, 1918. Para-i, aged thirty-eight; blood pressure on admission 138; headache; spots before the eyes; ratio of intake to output of fluids 1 :63. Has shortness of breath; epigastric pain. Bag induction was done on fourth day after prophylaxis was begun. A living baby was born voluntarily after twelve hours labor. No convulsions were experienced. On dismissal blood pressure was 124; ratio of output to intake less than 1. Patient has since reported in good condition.

Case IV.—Mrs. P., aged twenty-three, para-i, the wife of a young railroad contractor, had been a patient from the beginning of her pregnancy. Several times she showed traces of albumin, and on that account she was on a restricted diet throughout her preg-

nancy. Her blood pressure ranged between 110 mm. and 120 mm., and she was always apparently in good condition with the exception of the albumin. The urine was examined and found negative on Friday, February 22d, and her blood pressure measured 120. Saturday forenoon, the 23d, Mrs. P. called up and reported a headache, for which phenacetin was ordered, and the patient was requested to report her condition by evening. At 6.30 P. M. the telephone report came that Mrs. P. had fainted at dinner. On reaching the house in fifteen minutes, I found her on the floor of the dining room, unconscious and limp. No history of any convulsive seizure could be elicited, but the family was at once warned that she was in imminent danger of spasms. While a mouth gag was being improvised the first seizure occurred. The ambulance was ordered and responded immediately. In the meantime the patient was placed in bed, and in twenty minutes had the second seizure. She was in the hospital in forty-five minutes and a rectal examination disclosed a long hard cervix; no sign of labor, blood pressure 200, patient still unconscious, an urgent Cesarean section was decided upon and was done by Dr. B. L. Sulzbacker. The patient made a very gratifying recovery, and the baby was at no time apparently disturbed by the precarious experience of his mother. Both patients are now normal.

In this case the long hard cervix, the fact that three convulsions came unexpectedly in less than an hour, and the almost complete suppression of urine, led to the conclusion that a section was the only chance for a living baby, and gave the mother the greatest advantage by relieving her from the burden of oxygenating the fetus under a handicap, and also did away with the toxic foci which the placenta and the fetus doubtless constituted.

The welfare of the mother was a clear indication to the writer for a section, rather than to allow her to waste her life in an ineffectual attempt to relieve herself of the pathologic burden of the toxemia, and the physiologic burden of the fetus which she must simultaneously attempt.

Case V.—Mrs. J., para-i, pregnant five months, wife of a minister, referred by Dr. Clark of Wichita, was under observation for six weeks, with no abnormal indication. Blood pressure was normal, urinary findings negative, and the case an ideal one, it seemed, until a violent headache developed and symptoms of eclampsia and abortion were apparent. Dr. Harry Jones was kind enough to see the patient in Rosedale, as the writer was engaged in another case. She was given a hypodermic of morphine, ¼ grain, and sent into the hospital. The following picture presented itself: both hyalin and granular casts; right unilateral frontal headache; epigastric pain; general edema, cough, and vomiting.

Magnesium sulphate and veratrum were at once administered, and the patient put into a hot pack. Blood pressure dropped to 160 and pulse to 70. After three days the patient was running a

pulse of 90 and a blood pressure of 160 to 180. The indications showed no fetal heart beat; and no fetal movement was found after repeated examinations; it was believed that the fetus was dead.

The Voorhees bag was used as the best means of emptying the uterus, and labor followed in sixteen hours, a stillborn female infant at the sixth month being delivered. No further convulsions occurred, and the patient went home on the eighteenth day apparently free from evidence of the toxemia. A recent report gives her condition as quite satisfactory.

Case VI.—Mrs. S., aged thirty-two, para-iv, wife of a lawyer of Webb City, Mo., came November 15, 1917, for her fourth confinement, and, as at each of the former, with a toxemia. Headache, visual disturbance, blood pressure 145; urine showing albumin, hyalin and granular casts. Neuralgia of the face, which was traced to a pyorrhea, resulted in infection and absorption, which were relieved by extraction after an *x*-ray picture showed the point of necrosis.

As the pain and edema with insomnia persisted, the patient was sent to the hospital; McDonald 36; blood pressure 150. Induction of labor was done at 9.30 P. M., and pains began at 10.20. She was taken to the delivery room at 11 o'clock, and after labor terminated, was removed to her room at 12.15, two hours and three quarters later. Symptoms all cleared, and patient returned home in three weeks. She is now apparently well.

Case VII.—Miss M., aged sixteen, para-i, was seen at St. Vincent's hospital, where she had been for six months; during the last two months she was under the care of Dr. B. G. Hamilton. McDonald was 33, blood pressure 170, urine showed albumin, hyalin and granular casts. On account of her religious convictions, no active treatment was instituted. She was in labor forty-four hours with an R. O. P. and was finally delivered with Scanzoni forceps, of a fetus weighing 5¾ pounds. The patient was thoroughly exhausted. She left the hospital still showing hyalin and granular casts. Undoubtedly the bag induction would have spared her some of the long suffering.

Case VIII.—Mrs. N., para-i, aged forty-two, came into the hospital at the sixth month, having had false pains which were quieted by morphine. Her blood pressure was 120, and the urine findings were negative. She left the hospital with friends and took an automobile ride in the afternoon. At 3.00 A. M. she went into convulsions, having three before entering the hospital and two subsequently. As examination showed a long hard cervix with no softening, it was decided to do a Cesarean section. The uterus was studded with small fibroids. The patient made a perfect recovery. After two weeks she had no symptoms. The baby lived six hours.

Case IX.—Mrs. E., aged thirty, para-ii, entered St. Vincent's with a blood pressure of 240 which had continued for six weeks. Daily examination showed no trace of albumin or casts. The day before delivery, which was normal, a trace of albumin appeared. Her treatment was magnesium sulphate and veratrum which did

not effect the height of the blood pressure. She was delivered of an 8-pound baby and left the hospital with a normal blood pressure and no pathologic urinary findings.

Case X.—Mrs. D., aged twenty-two, para-i, came from Colorado and entered the hospital on April 8, 1918, under care of Dr. B. G. Hamilton. Her blood pressure was 200, and she had marked disturbances of vision. A specimen of her urine from a week before had been negative, and blood pressure 124. She thought the visual disturbance was caused by the fact that she had broken her glasses, and by the edema due to pressure from the uterus. We found the McDonald measurement 36, and her history showed her to be at term. She was given the usual prophylaxis, and put into a hot pack. The pains began voluntarily and she delivered herself with no artificial assistance. The blood pressure fell to normal and remains unchanged. Urine is negative, but she still complains of some headache.

Case XI.—Mrs. B., aged twenty-six, para-ii, was seen with Dr. B. G. Hamilton, March 25. One week before, the doctor found albumin, but no casts in the urine, and a blood pressure of 120. On admission the blood pressure was 180, pulse 90, urine showed albumin, hyalin, and granular casts, and was scanty. She had right unilateral headache, red spots before the eyes, and epigastric pain. Blood pressure rose to 190. An induction was done after prophylactic treatment failed to hold symptoms in check. After the bag was placed, the blood pressure dropped to 150. She was delivered in eight hours. Both mother and child left the hospital in good condition. On examination, the baby's urine showed albumin for three days, as it does in many of these cases. No albumin in urine of mother or child on discharge.

Case XII.—Mrs. A., aged twenty-four, para-i, entered the General Hospital at the sixth month of pregnancy, passing in twenty-four hours 1 pint of urine, showing albumin, hyalin, and granular casts. After diet and prophylactic treatment the patient went home, all symptoms having subsided; nor did they return. At term, she came into the hospital again and delivered herself voluntarily without symptoms of toxemia. This patient had previously undergone two surgical operations, an appendectomy and a fixation.

Case XIII.—Mrs. S. K., a para-iv, came into Ward Three, the maternity department of the General Hospital March 12, 1918, after having had twelve convulsions and being comatose and edematous, with a blood pressure 240. Hot pack, veratrum and magnesium sulphate were at once utilized, and the symptoms subsided. The patient was discharged March 31, in good condition. Dr. Hamilton recognized the patient as having been seen twice in her home in eclampsia. All the babies were born alive.

Case XIV.—Mrs. G., para-i, aged forty-two, in eighth month was referred by Dr. E. H. Miller of Liberty. She was admitted at 4 A. M., coming by ambulance from her home. Patient was having convulsions in rapid succession, had general edema, which, on invading the glottis, caused a breathing resembling that of a child with croup. Her blood pressure was 220; pulse 120, and temperature

101.8°. Although the cervix was softened, no effective labor was yet begun. No fetal heart, and no fetal movements could be ascertained. The routine induction of labor by Voorhees bag was done after veratrum, ℳx; croton oil, ℳii, by catheter into the stomach and sulphate magnesium 1 ounce by lavage also. Veratrum was repeated at 6 A. M., and blood pressure dropped to 160 at 7.00; it was 190 at 8.00, then 180, and at 9.15 it was 195. Veratrum at 9.15 and blood pressure at 10 was 185. At 11.00 it was 200 and at 12:00 no change. At 1.00, after the hourly exhibition of veratrum, it dropped to 140. Vision was dim, although patient was now rational. Vomiting and convulsions were persistent. Proctoclysis of soda bicarbonate 2 per cent.; and glucose 5 per cent.; were given. The twenty-four-hour intake was 1330 c.c. and output 5.50 c.c. At 6.45 a stillborn fetus was delivered; weight 5 pounds 6 ounces. The placenta was delivered. Her blood pressure ranged from 160 to 220 after the delivery, and the intake and output would stand 1700 c.c. to 1640 c.c. whereas before delivery, intake and output was only one-third of recorded intake. Sodium phenol phthalein test for efficiency gave a very low response. On Nov. 17, the patient was up in a wheel chair. She was very cheerful and invited the doctors and nurses over to Clay County for a chicken dinner at an early date. Her pulse was 88.68 and 76; blood pressure 180; intake 1860; output 1600 c.c. She was apparently convalescent and prepared to return home next day. Without warning the blood pressure went to 200. Kidney secretion was completely suppressed, the patient became comatose, and expired. This was evidently a case of eclampsia grafted on a chronic nephritis.

CASE XV.—Mrs. P., para-i, entered hospital February 26, with a blood pressure 180, urine showing albumin, hyalin, and granular casts. She was given magnesium sulphate and a large quantity of fluids, and was put in the pack. The blood pressure remained between 160 and 190, and the albumin constantly increased. Vision was much impaired; vomiting and diarrhea persisted. She was prepared for a Voorhees bag induction of labor, which was done on March 1. Labor began in four hours, and the patient was delivered in nineteen hours voluntarily. She left the hospital the third week; the symptoms showing but slight albumin.

CASE XVI.—Mrs. J. B., para-i, aged twenty-five, admitted March 31, with blood pressure 200. No other symptoms. She went into labor voluntarily, was given veratrum ℳx, and magnesium sulphate ℨi. She delivered herself after three hours, and her blood pressure fell to 160—in five hours to 130. The urine on admission showed albumin 4 plus diacetic acid and indican. Her recovery was uneventful. On dismissal blood pressure stood at 118, and pulse 90.

CASE XVII.—Mrs. H. S., aged twenty-six, para-i, was admitted February 17, 1918, at 2 A. M., having been delivered at home by Dr. W. M. Sams, who was her attending physician, and who assisted throughout the case. She developed convulsions three hours postpartum. Eight convulsions were suffered before she reached the hospital, unconscious, with blood pressure 150, pulse 100, and temperature 103°. The patient improved under the routine treatment.

She became conscious and was apparently convalescent when symptoms became aggravated, peritonitis developed, and septic myocarditis set in. A severe ophthalmia had sprung up, affecting the left eye, and the pus, on being cultured, gave a positive Neisserian reaction, as did also the vaginal discharge. Doubtless the septic myocarditis from which she finally succumbed could be traced to the Neisserian infection, proving, as Dr. LaVake maintains, that all eclampsias may be accounted for by some infection if we can but find the source.

Case XVIII.—Mrs. H. L., para-i, a college woman, aged thirty-four, McDonald 36 ½, Ahlfeld 27 ½, was seen in consultation with Dr. B. G. Hamilton. She entered the hospital April 18, 1918, and although seen frequently at home, with no evidence of toxemia but slight headache and some difficulty in sleeping, it was found on admission that marked symptoms of eclampsia were in evidence. Blood pressure was 200, pulse 62, unilateral headache, disturbed vision, and insomnia were marked. The blood pressure dropped to 160 and ranged back to 200. Intake 1710 c.c. output 1560 c.c. Patient became very restless, as well she might, carrying the burden of an eclampsia, a right occipitoposterior position, added to a mitral heart lesion. Labor was induced, and every two minutes the patient was having pains lasting a minute. The bag was expelled and dilatation tolerably well established, but rotation had not taken place when the patient developed a terrific convulsion lasting two and a half minutes. She was at once put under ether anesthesia and delivered by Dr. Hamilton by version. The baby was stillborn, a condition evidently the result of the maternal toxemia and the convulsion. The mother is today apparently convalescent, no further symptoms having arisen, and the blood pressure being 124 mm.

It would be a needless waste of your valuable time and simply a repetition to enumerate further the cases which go to make up this very remarkable list which now reaches the number of forty-four individual instances of pregnancy toxemia since May, 1917, and twenty-three of them since January 1, 1918.

One can hardly see how such an experience as this can be accounted for, as has been said, one ascribes the prevalence of these toxemic explosions to climate or atmospheric loss of equilibrium, as has been claimed by Dr. E. H. Miller. Several years ago, he read a paper on epidemic eclampsia, and recently told the writer as an evidence of epidemic herpes zoster that he had during the past winter seen and treated nine cases of shingles in his own practice. Whatever opinion one may hold as to the etiology of these toxemias, one is struck by the fact that the results of a system of routine examination and laboratory reports, including urinalysis and the estimation of kidney insufficiency by the sodium phenolphthalein test, which is now being done as a routine; the careful record of

intake and output of fluids; the careful observation of blood pressure; and the treatment by veratrum, magnesium sulphate, hot packs and plenty of fluids, in comparison with other systems, has been found unusually satisfactory. Furthermore, the Vorrhees bag in the hands of the writer has demonstrated itself over a hundred times in the last year as the conservative and safe instrument for inducing labor with the least shock, the greatest accuracy, and, generally, the safest results. These patients are not free from the menace to their lives until they are delivered and the source of the toxins removed.

The results here obtained could not have been accomplished in the home of the patient; and it is emphasized most strikingly by these toxemic cases, as well as by the other obstetric emergencies, that the only ideal environment for their protection is that of the hospital.

To summarize: Toxemia of pregnancy and eclampsia are due to change of metabolism resulting from faulty proteid and fat, from an undetermined toxin from the growing ovum, resulting in infarcts and other pathologic changes of the kidney, liver, thyroid, brain, and spleen. These toxins are thrown into the blood stream, the products of autolysis of placenta infarcts from which dying particles are carried to the kidney, liver, etc., and cause focal necrosis. Hyperthyroidism is only an incidental evidence in the vicious circle.

The extra burden thrown on the mother of warding off this poison and of oxygenating the fetus overwhelms her powers of resistance. Especially may this result in alternating extreme cold weather and mild days as she is unable to stabilize her powers of resistance. A loss of equilibrium between the centers and periphery of the body causes an acidosis because of the unstable condition of the metabolism. Failure of elimination results in stasis; maternal oxygenation is decreased; lung expansion and heart action are disturbed; asphyxia results; foci of infection in teeth, tonsils, and colon infections may usually be demonstrated in toxemia. Adrenalin output is increased; blood pressure is raised; and blood coagulation is abnormally increased in toxemia.

Consequently prophylaxis, including diet, bland foods, and plenty of fluids, elimination by magnesium sulphate and sweats, eradication of foci of infection are to be planned. Asphyxia is avoided by deep breathing and fresh air. Acidosis is anticipated by alkalies. Blood pressure is reduced by veratrum, not by phlebotomy. All other measures failing, the final resort is to empty the uterus. This

should be done under ether anesthesia, as ether is the only safe inhalation anesthetic in these cases, as follows:

1. Preliminary dilatation gradually by Hegar's dilators up to No. 20.

2. Voorhees bag No. 4, if at term, introduced by Reed's method-cigarette roll, held by Pean's forceps. Lavage of soda bicarbonate 2 per cent. after uterus is emptied. Cases of the fulminating type, with long hard cervix (in which no vaginal examination has been done) are best treated by classical Cesarean section.

When, after contamination by frequent digital examination, infection is almost surely to be expected, a Porro or other hysterectomy should be done in the interest of the mother (see Franklin Newel's statistics of results near Boston 100 per cent. mortality).

The results in the series of cases from which these conclusions are drawn, showing 95 per cent. of recoveries of mothers, and 85 per cent. of the children at term, at least warrant the belief that since Tweedy's tables showed maternal mortality of 8, De Lee 20, Williams 25, Cragin 28, N. Y. Lying-In 30; the average American 38; the Royal Maternity of Edinburgh 66 (these figures being from De Lee's Year Book, 1918), our results are far above the average, or else our cases have been less toxic than those encountered elsewhere, which is not likely the fact.

From our own experience and from that of other observers, including a most interesting report just received from Dr. Ben Myers, who does a large obstetric work in Alaska, and who finds that during the last year, an unusually cold wet season, 12 per cent. of his cases suffered from toxemia, the conclusion is drawn that the weather does at least aggravate the tendency to this condition. As there is such a close relation between the toxemia and the nervous system, is it not also fair to ascribe to the war an incidental effect as a causative factor?

The moral to be drawn, then, is that pregnancy is a condition in which the patient is peculiarly susceptible to external atmospheric influences, and to psychical impressions which disturb the nervous equilibrium. She should, therefore, be inspired by a cheerful optimism that we are going to win the War, and make the world safe for future generations of freeborn people.

DISCUSSION.

Dr. William M. Brown, Rochester, New York.—I understood Dr. Mosher to make one remark in connection with this subject

to the effect that in all of these cases of eclampsia we will find some focus of infection if we look far enough for it. Did I understand this to be absolutely independent of the pregnant condition, or that cases of eclampsia are due to something besides the pregnant condition?

DR. MOSHER.—No.

DR. W. M. BROWN.—I am glad that I did no so understand him. So far as the treatment of pernicious vomiting goes, I am much interested in that phase of the subject. I am still at sea a little bit on the question of corpus luteum. I have had one of the most dramatic successes with the use of the soluble extract of corpus luteum in the treatment of pernicious vomiting that one could imagine. It was a case in which three separate times therapeutic abortions were done. That patient was nearest to death of any patient I ever saw and got well when she had had a therapeutic abortion performed. She came under my care the subsequent year and she went through the same thing, and I struggled with her for several weeks. I did everything I could think of in the hospital with three nurses, night and day, with rectal feedings, and so on. Her temperature rose to 102° F. and pulse to 170. I did not wait any longer. I induced abortion and she recovered. The subsequent year she had the same thing again and I waited as long as I dared. A year ago this time she became pregnant again willfully and said she was bound to go through with it. She went on and vomited for two weeks pretty near and was severely prostrated; I put her on the soluble extract of corpus luteum, giving her 1 c.c. every three hours for three days. Inside of a week every bit of her vomiting stopped. She went home, and in two weeks she could eat almost anything. She went right straight through to a normal termination of pregnancy and has her baby.

Subsequently I tried the corpus luteum in a number of cases and in one or two I tried the soluble extract of the whole ovary, and in others I tried the soluble extract of the ovarian residue. In one of them I thought I got just as good results. One I put again on the soluble extract of corpus luteum and it failed absolutely. The second dose of the ovarian residue seemed to control the vomiting. I cannot help but think that was a coincidence, and that I was getting the delayed effect of the corpus luteum. But I am convinced of one thing, that there is some virtue in the ductless glands, either in the ovarian secretions or something somewhere that controls or brings about a marked effect on these toxemias of pregnancy and especially on this pernicious vomiting early in the pregnancy.

DR. HERMAN E. HAYD, Buffalo, New York.—I do not practise obstetrics, but this is an engaging subject for all of us. I was struck by an article I read the other day in *American Medicine* by Arnold, of Philadelphia, who is connected with the Good Samaritan Hospital. He took up the question first of all, that pernicious vomiting was the result of the absorption of toxic products due to syncytial changes at the placental site, and that the later manifestations of toxemia of pregnancy were the result of the absorption of toxines, consequent upon the development of the embryo and the growing fetus and in order to overcome the toxic influences of these products

it was necessary, first of all, to overcome the acidosis, because at the bottom of this condition was an acidosis, and for that reason, he suggested continuously, by the drip method, three teaspoonfuls of carbonate of soda in a quart of salt solution, and to give by mouth 10 grains of bicarbonate of soda to the ounce of water, allowing the woman to take as much as she could, if for no other purpose than to wash the stomach out and to give her fluid to eject more easily, and to place her under the quietest surroundings, because he believed it was possible by suggestion to influence some of these patients; and that in the last few years, although he had treated patients that were really moribund, he had never once found it necessary to bring abortion. Again he believed, since the early toxic symptoms were the result of these syncytial cell changes, after a time the woman established within herself an immunity, so that any poisons that developed would be taken care of and she would not respond to any irritation. For that reason he suggested, after the teaching of some man in Vienna, whose name I do not at present recall, that these patients who were suffering from pernicious vomiting should be injected with 20 c.c. of inactivated serum of a woman who had established this immunity. For instance, to take from a woman who was not toxic, who was in every way well and who was carrying a baby say of seven months, 20 c.c. of blood serum and inject that amount into the vein of the woman who was suffering from the toxic vomiting. In one case the effect was so dramatic that I was surprised. I wondered whether it was not possible that suggestion might have done it, and, therefore, as a *sine qua non*, he places these patients in a hospital away from all over-anxious family influences and from all doctors who have depressed them by unfavorable prognoses. It is difficult to get patients in a hopeful condition of mind with friends and family about them. He also says, it is difficult to find a donor. It seems to me, there are hundreds of women pregnant who would give their blood for this purpose and you could establish by your blood examinations whether there is any syphilis or not, and, therefore, the treatment should be thoroughly tried out. If this subject is of sufficient importance for you men, I would suggest that you read this article.

Dr. Abraham J. Rongy, New York City.—I am very much interested in the use of fetal serum in conjunction with the pernicious vomiting of pregnancy.

Some five or six years ago I became interested in this subject from the standpoint of the use of fetal serum in inducing labor. I reported a series of eighteen cases at that time, and while they were not all successful, I felt there was something in the fetal serum which had the power of contracting the uterus. I conceived the idea that in most of the cases of pernicious vomiting of pregnancy there is a poison produced by the product of conception, and that it is possible to take the blood of a woman who is pregnant normally, and who has been practically immuninized against the possible toxemia of pregnancy, and inject that in women who suffer from severe toxemia of pregnancy. Along that line I tried it out in six cases

which I reported in the American Journal of Obstetrics and Diseases of Women four years ago. In the first two cases the serum made a favorable impression and I believed that here we have an excellent treatment for the pernicious vomiting of pregnancy. A third case was not successful, nor was the fourth, and in my sixth case I had to induce labor, in spite of the serum injection. I did not give these patients 20 c.c., I gave them 10 c.c. of filtered serum every twenty-four hours.

As far as the pernicious vomiting of pregnancy is concerned, I have tried everything that has been suggested and recommended, and am still at sea as to what to do in this condition. Luetin extract in small or large doses will help in some cases. The very severe and toxic ones are not helped by anything, and if you wait long enough they will die, and I have seen them die due to the pernicious vomiting of pregnancy in the third or fourth month. We do not know the cause of it. We will try everything for the time being, and while we may think we have struck the right idea and are on the right track, still there are cases that do not respond to anything. We still have to find the cause of pernicious vomiting of pregnancy.

Dr. Jennings C. Litzenberg, Minneapolis.—I think the paper and discussion emphasize the fact that we are floundering in a sea of empiricism, and that every one of us who has tried this thing and that thing has had spectacular results from using them. In ten years I have not aborted a woman for pernicious vomiting, and I have used nothing but sodium bromides and chloral. What does that mean? It means nothing except that I have been fortunate. I had one result which was just as spectacular as anything that has been reported either this morning in the paper or in the literature, and the therapeusis was nothing. This woman had been vomiting severely and we decided that she had gone as far as possible and must be aborted. Therefore, the determination was made to empty the uterus the next day and she stopped vomiting and went on to a complete recovery and gave birth to a normal child. All of this emphasizes that we should be on the lookout not only for the therapeusis of this thing but should continue to seek the toxin, and I rise simply to make the plea for every one who is connected with a university, or who has any access to a physiological chemical laboratory to use all of these facilities for finding out, if possible, what is the cause of this pernicious vomiting of pregnancy. I have been floundering in some of the experiments. My inaugural thesis to this association was on "The Occurrence of Urobilin and Urobilinogen in the Urine of Normally Pregnant Women," in which I established the fact that urobilin and urobilinogen occur in a very large percentage of pregnant women. I have carried that study further, but I have no conclusions yet to offer. However, I want to report verbally that I have not yet found a single case of pernicious vomiting of pregnancy that did not have the urine overloaded with urobilin and urobilinogen. I do not know what conclusions to draw from it, but it seems to me the only conclusion to be drawn is that our solution of this problem lies in the field of physiological chemistry,

and I want to make the plea that any one who has access to a physiological chemical laboratory should use every possible facility for chasing down this toxin and quit our floundering around for something to cure it.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—We have every reason to look for final results by making a differential diagnosis of the toxemias in these cases. The word toxemia carries only a general sense with it. It is the specific toxin or toxins in the individual case that must decide our method of therapy. Every enthusiastic doctor can report a fine series of cases on a special course of treatment, yet sooner or later he will come to his Waterloo in another series of cases that will knock out the remedy he has previously used. Let us take the effects of different toxins, and we know how differently they affect different organs. We have that so frequently demonstrated that I need not illustrate it here. The time must come when we will be able to isolate the individual poison and find a counter remedy for it.

Dr. Arthur E. Skeel, Cleveland, Ohio.—It is perfectly apparent to those of us who have had any experience with these cases, that a great many of them are psychic, and these psychic cases again offer many of the spectacular cures we obtain. Almost anything that will produce an effect on the mind of these patients will cure a certain percentage of them. We do not know in which of these cases that is going to happen. The changes that take place we call toxic because of want of a better name.

With regard to the question of immunity and special toxins, we do not know much except that a great many of our so-called immunities may be due to certain changes which permit elimination. At any rate, in all the toxic cases we have a definite picture of a patient with coated tongue and lack of fluids and all things that ordinarily go with toxemia, and we have very definitely a vicious circle existing. I do not mean to say a word against all these attempts to find something specific, but until we have some specific the best thing we can do with most of these toxic cases is to attempt to break this vicious circle. The patient for some reason or other fails to eliminate toxins, and when she fails to do that she vomits more. When she vomits more, she has less fluid in her system and the tissues are more concentrated and her kidneys eliminate less, and that vicious circle continues and gets worse and worse. From the standpoint of experience, if one begins definitely with an attempt to break up the vicious circle by supplying that patient with fluid by one method or another gradually and steadily, at the same time getting elimination, supplying her with whatever she takes in the way of nourishment in the most minute quantities, a great deal can be done for her. You can break up this vicious circle, and, carefully securing elimination, secure the supply of fluids to that patient, because after all, from a common sense standpoint, this condition means that the patient is lacking fluid, therefore she cannot eliminate. It is very essential to get them in a hospital and under a perfectly competent nurse; get them away from the

influence of their families, and if you see the patient two or three times a day and supervise what she has to take and how much fluid is to be given, you can manage the vast majority of these cases.

Dr. Magnus A. Tate, Cincinnati, Ohio.—As our experience increases in the handling of cases of eclampsia, the more we become impressed as to the exact way of treating each individual case. There are some cases from the beginning that seem to be doomed, and it does not seem to make any difference what kind of treatment we may give, this patient dies.

In August last five cases came into the Cincinnati Hospital on my service with eclampsia. One woman died two hours after admission, and in washing out her bowels, it seemed to me that they had not moved for a week. She had had thirty convulsions before she was admitted, and the physicians in charge while patient was at home did not make any attempt to clean out the intestinal canal. The second case died seven hours after admission, and in washing out her stomach we got a conglomeration of food she had been eating for two or three days.

The care of women before the time they reach labor is being more and more emphasized every day. I believe it to be very beneficial that women should limit the intake and increase the output, in other words pregnant women should be put on a good regular but plain diet, and their bowels, their kidneys and skin should act freely.

This has been impressed upon me so much lately, that I have prepared a short paper to give to every woman who has been confined in our City Hospital. This little pamphlet is worded something like this: As soon as you are pregnant or think that you are pregnant, go to the clinic or to some physician and put yourself under his care, so that you can be told the proper clothes to wear, the kind of food to eat and the general care of yourself and your body. The second thing is to see that you are capable of giving birth to a child by having the measurements of your pelvis taken and your body examined; and third, is a warning of various injurious symptoms which may arise. If you notice that you have any watery or bloody discharge, scanty or highly colored urine, pain in the head, spots before your eyes, edema, or pain in the pit of the stomach, or badly constipated, immediately seek the clinic or your physician for treatment.

I believe by such a simple system of education we can do away with many of these cases of pernicious vomiting of pregnancy and eclampsia.

Dr. Louis Burckhardt, Indianapolis, Indiana.—The difficulty about coming to definite conclusions in regard to these cases is that the reports are so few. We ought to have an enormous number of case reports in order to draw any definite conclusions. Dr. De Lee in his year book for 1918 mentions the point that if we only had the courage to run a series of cases along medical lines and another series along the plan of Christian Science, trying to find out the best methods, and which ones to treat and which ones to let alone, then we might come to some definite conclusions.

The European reports of 1917 about childbirth, infant mortality,

and so on, show that under the war conditions eclampsia has almost completely disappeared from the German Empire. In other words, they have been Hooverizing over there before we ever thought about it. (Laughter.) The same reports show surprising results in that the average size of the child has increased on the limited food. However, we must make this statement which we have to acknowledge, namely, that they give double rations to pregnant women over there. They give every young married woman double rations for eight weeks.

I want to mention one thing with reference to the introduction of bags or the use of bougies. If you get labor started in the pre-eclamptic stage, watch the blood pressure and the albumin immediately after the onset of labor. That means as soon as labor pains set in, and you will find to your surprise that the blood pressure falls and the albumin falls a long time before rupture of the membranes.

Dr. C. Hollister Judd, Detroit, Michigan (by invitation).—I have used a good deal of corpus luteum for vomiting of pregnancy and it seems to do well in certain cases, but I rather doubt very much if the vomiting was pernicious. Most of these women will vomit and then stop vomiting. I usually use it in the severe cases, stop it for a time, and then try it again. In using corpus luteum hypodermically you have control of the patient. You see her every day in the house; you have an excuse for coming and she will feel satisfied or the members of her family will because you are doing something. In this way you have absolute control, and whether it is the physical effect or not, I do not know, but it does the work in many instances.

To one of these women I gave corpus luteum for two or three days and then iron, arsenic and strychnia hypodermically, and the effect was better than with the other. It seemed to me, it was purely psychical.

There is one other point that Dr. Edgar mentions in his book in regard to cureting the cervix in these cases. A friend of mine curetted a woman who was pregnant, for pernicious vomiting. It was pernicious in this case because she lost 30 pounds. After the curetment she immediately stopped vomiting, put on weight and was subsequently delivered of her baby. Now, whether that was psychical or not, and whether he did something to the cervix or not, I would like to know.

Dr. Mosher (closing).—I am sorry that there has not been more definite discussion of my attempt to standardize the treatment of toxemia. We know that regardless of the fact that you can put your finger on this woman and say she has pernicious vomiting and the other woman does not have it, there is a consensus of opinion as to what constitutes toxemia. When one goes to a woman who is pregnant and she has some type of infection somewhere, one knows it is due to a toxemia, if otherwise, why should not every patient who is pregnant have toxemia? There is no use for us to become hopelessly pessimistic. Pessimism does not increase our results. By being pessimistic, you may say that a certain number will die, let

them go. I do not like that sort of discussion which says: "No one knows what toxemia is. If the condition is purely mental, there is no use of giving medical treatment." Until we can demonstrate what constitutes toxemia treatment must be empirical. When we find out the source of the toxin and treat it rationally we will get results. In the meantime, if I have had forty-nine cases and only two of them have died, and of these two, one had streptococcic infection before she came in, and the other one had a chronic nephritis, my results demand some respectful consideration. Of course, some of these patients might live without treatment, as patients live through all sorts of conditions without treatment. Since we have followed a method that has given results, it seems to me that others should do likewise.

I am glad to have started a discussion in this association on this subject, and whether my theory is carried out or not, I know these conditions can be treated with better results than formerly since I have gotten these results that are worthy of consideration.

As to the use of corpus luteum, you must bear in mind that two of these women previously had had abortion done twice, and these were not morning sicknesses but cases of true pernicious vomiting; therefore, if I have six cases and get six satisfactory results, I feel I have 100 per cent.

PATHOLOGIC CONDITIONS OF THE PELVIC VISCERA, THE RESULT OF INDUCED ABORTIONS CAUSING STERILIZATION, DISCLOSED BY ABDOMINAL SECTION.*

BY

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THE vengeance on part of Nature inflicted in return for an insult offered the procreative organs in the female when in vital physiologic activity, often steeps a woman's future into such gloomy depths that she will gladly court any sort of a measure, and willingly undergo serious risks in the hope that her damaged organs may again be restored to normal function.

With many women an abortion is not regarded as a great crime, and when the physician listens to the history of the early years of a married woman's life and is told that as many as fourteen abortions had been induced, he marvels how readily a woman can condone this act.

This paper is prompted by a record of eight cases of sterilization, the result of induced abortions. All the women were married, in good health, and none over thirty-five years of age. In each instance the abortion was induced soon after the first period had been missed, usually the second or third week.

The method was invariably instrumental, *i.e.*, with the catheter or sound, and was usually successful within five days. Prior to the instrumentation, hot water douches, hot foot baths, supplemented by mustard applications to the lower abdomen, and in four of the cases medicines, such as fluid extract of ergot or pennyroyal, were resorted to without success.

It is of interest to note the number of abortions induced in these women.

3 women were relieved 5 times in 2 years.
2 women were relieved 6 times in 2½ years.
1 woman was relieved 9 times in 3 years.
1 woman was relieved 11 times in 3 years.
1 woman was relieved 14 times in 5 years.

None of the women suffered any serious consequences following these abortions, that is, they were not seriously sick. Most of them experienced a general malaise, possibly due to a slight elevation of temperature, while a few were confined to bed for several days. In no instance was it necessary to consult a physician. After a week all discomfort usually had passed, and they again went about as they were accustomed to.

As a consequence of these induced abortions, menstruation was in most cases irregular, painful, and often profuse for months after. In five of the cases this condition remained, while in the other three the menstrual function again became normal. A leukorrhea in six of the cases manifested itself soon after recovery from the first abortion and remained constant; the other two were free from this annoyance. All eight cases suffered more or less from backache. Subsequent abortions added to the severity of this backache.

From the cursory history of the cases, it can be seen that the clinical course of these abortions was not severe, that the general health was not impaired, and that to all appearances the pelvic organs were not damaged to any serious extent. However, as time went on these same women noticed that they never "missed" any more, thus causing their worries to become a matter of the past, for the time being, at least.

As years passed and the thoughts of these women, by worthy motives, were being directed into channels which led to the loftier ideals, they became obsessed with the wish to have a child. The recall of former experiences, when it seemed so easy to become pregnant, only made darker the pages of remorse in their lives, and now, when willingness and eagerness were uppermost in their hearts, they found themselves sterile. The chapter of their lives that followed teemed with consultations in the office of the gynecologist. They cheerfully submitted to treatments which buoyed them with hopes from month to month, only to find that at the end of their course of treatment they were just as sterile as they were before they consulted the gynecologist. The treatment was generally of a routine nature and consisted of dilatations, curetments, the introduction of intrauterine wire pessaries, tampons, and the so-called uterine tonics. Most of these cases were under treatment for many months.

It must be said in due justice to such treatments that they are often successful in relieving certain forms of sterilization, especially when a chronic endometritis or a retroflexion is the active agent

responsible for the sterile state. However, when a patient has been under the care of a conscientious gynecologist for two or three years, and the desired result has not been achieved, a continuance of these measures is hardly warranted. It must then be inferred that other conditions are responsible for the sterility, and their presence, if possible, should be determined. In the eight cases cited, the true lesion was not diagnosticated before operation. For this the reasons seem cogent.

When we consider that there was no positive evidence of any severe pelvic inflammation following these abortions and that these women at no time appeared seriously sick, it can be seen how readily an intrapelvic trouble could be disregarded. It must be borne in mind, however, that these abortions were induced instrumentally and very likely not under the strictest aseptic precautions. Again, the frequency of the instrumental interference must not be overlooked. The abuse of such delicate structures inevitably invites bacterial invasion, and through the unavoidable trauma, though small, these tissues must eventually suffer from an infective process with far-reaching consequences. It is quite different when an abortion is induced by drugs. The chances for a woman to conceive in later years, who has aborted through the influence of a drug, are far better than those of a woman whose abortion was induced with an instrument.

Abortions induced by drugs rarely become infected when left alone. It is only when the infective material is carried in through an examination, or when an attempt is made to do something for the woman with an instrument, that the decidua usually become infected. Furthermore, should the uterine contents in such cases become infected otherwise than through the use of instruments, the septic material would not find any traumatic avenues whereby it could readily reach the deeper channels. Such infections, as a rule, remain arrested *in loco*. An instrumentally induced abortion offers far different inducements to the dissemination of infectious matter. Here the damage to the tissues may be so great that the septic material may reach the deeper channels before Nature has had time to prophylactically prepare the field. It does not seem to matter much with Nature whether or not the virulence of the infection be of a high or of a low degree, its work to prepare the neighboring structures that they may offer a high grade of resistance to the invasion is carried on to a surprising extent in the face of any kind of an infection. This has been exemplified by the cases cited in this paper and it demonstrates how vaguely the

pathologic conditions resulting from an instrumentally induced abortion can be judged. The physical examination in cases of this character reveals nothing definite relative to an intrapelvic condition which might be present. It is true a retroflexed uterus can be readily recognized; a prolapsed ovary, always painful to the touch, is easily diagnosticated; a small ovarian cyst, like a chronically diseased appendix, will rarely escape notice; but as to the condition of the tubes, the character of the lesion usually remains in doubt. There is only one diagnostic way by which the true nature of the intrapelvic condition can be disclosed, and that is by abdominal section. It is not often that a woman, who has become sterilized through induced abortions, is desirous of having her condition cleared up in this manner; however, there are some who are so anxious to have a child that they are prone to accept any advice which may result in a pregnancy. During the last six years I have operated on eight women in the hope of relieving their sterility. The operation, an exploratory abdominal section, was in each case performed after these women had been subjected to therapeutic and minor gynecologic measures for a time sufficiently long to give convincing evidence that, without any further intervention, the sterile state bade fair to remain permanent. It may be assumed, from a limited experience, that no woman sterilized through the induction of abortions should be subjected to a major operation unless her condition has, for at least two years, received careful study and the application of such minor gynecologic treatment as may be indicated. Neither should the time of such a course be carried beyond three years. This assumption has been repeatedly borne out where an obstacle to conception has been overcome by instituting minor gynecologic measures, allowing a reasonable length of time for restitution to take place in the damaged structures.

The eight women subjected to abdominal section gave positive evidence, upon exploration, that conception was impossible in the condition they were in. The pathologic conditions disclosed presented a strange similarity. This may be attributed to the presence of a low grade of infection. It must be remembered that the women were all in good health; that the method of inducing abortion was, very nearly, the same in all cases; and that the time chosen for the abortion was, usually, within three weeks after the period had been missed. That the pathologic process had been slow in its progress was evidenced by the numerous abortions that had to be induced to bring about a state of sterilization.

Summing up the operative findings in these cases it was revealed that in all cases, except one, the ostium abdominale of both tubes was closed. This was the positive factor producing sterility. In five of the cases bilateral hydrosalpinx existed. In two, the hydrosalpinx was unilateral. The opposite tube in the latter cases was collapsed and presented a sacculated appearance, the lumen giving evidence of a number of strictures. In one case no hydrops of the oviducts was present; the tubes, however, were sacculated and the uterine ends were closed. In each case the tubes were dislocated into Douglas' pouch and usually bound down with firm bands of adhesions and false membranes. On the left side the tube was buried under the sigmoid, while the tube on the right side was attached by adhesions to the cecum and appendix.

Examination of the ovaries revealed that pathologic processes had invaded these organs. No ovary was found in its normal position; all were more or less prolapsed and adherent to the tubes. In several instances there was a matting together of ovary, tube, uterus, and rectum. Some of the ovaries were twice their normal size, and all gave evidence of cystic degeneration.

The effect of a perioophoritis was shown by a great thickening of the surface of the ovary in over half of the cases. When such a condition is found bilaterally, it must be regarded as a potent cause of sterility, inasmuch as the thickening over the surface of the ovary forms a covering that is stronger than the intrafollicular pressure of the Graafian follicle is able to rupture. In most cases the uterus was found retrodeviated and fixed by adhesions, which secondarily disturbed the important anatomical relations between ovary and tube. The correction of these pathologic conditions was undertaken in as conservative a manner as possible, *i.e.*, none of the structures were sacrificed, excepting a resection of some of the ovarian substance presenting marked cystic degeneration. In some of the ovaries this was extensive. The uterus, tubes, and ovaries were freed from their adhesions and brought into as normal position as circumstances would permit. This was carried out satisfactorily in most cases. The abdominal end of the occluded tubes was opened and cuffed back, and their lumina explored with a sound. The ovary was fixed as near to the ostium of the tube as possible. In several cases the abdominal end of the tube was sutured to the ovary.

As a result of these operative measures, two of the women became pregnant, and went to full term, within twenty months after the operation. These two women had bilateral hydrosalpinx and re-

section of both ovaries was necessary. They were the youngest of the series and were respectively twenty-six and thirty years of age. The remaining six women, operated on within the last four years, are still sterile.

As to the possibility of correcting an existing pathologic condition, which may act as an obstruction to impregnation, no assurance can be given. Operations for this purpose are only hopeful measures undertaken with a view to restore to a normal relationship the structures that have suffered from an infective process, and to extend to the woman her only chance to become pregnant. Nothing definite can be formulated from a surgical procedure undertaken for the purpose of removing a barrier to pregnancy.

DISCUSSION.

Dr. Arthur J. Skeel, Cleveland, Ohio.—I would like to ask Dr. Reder whether in these sterile women the spermatozoa were examined microscopically before instituting treatment.

Dr. Reder.—I eliminated an examination in every case. Inasmuch as these women had so many abortions everything seemed apparently all right on the other side. Neither were the secretions from the tubes in hydrosalpinx cases examined.

Major J. Henry Carstens, Detroit, Michigan.—Dr. Reder's paper is, I think, very timely considering the great war and the falling birth rate and the anticonception methods and everything else, and I think we should do all we can to help those women who desire to have children. There is absolutely nothing to be criticised that I can see except the time. Having had a good many of these cases to deal with, as Dr. Reder has, I do not temporize with them very long. I find in most of the cases the women have been subjected to local treatment by physicians, but not only that, most of them have been subjected to dilatation and curetment, and the uterus and the cervix have been placed, as a rule, in a normal condition. Some of these women have been curetted several times. These women have some form of pelvic trouble, and I waste very little time on these cases. Sometimes you can diagnose adhesions on account of pain you produce in the uterus by conjoined examination. You find by making traction in a certain direction that there is pain which means that there are some adhesions somewhere, and if you pull on it it will produce pain. In some of them you cannot do this. In these cases, instead of waiting, I simply explain to the woman that they have a chronic inflammation with adhesions, that the tubes are closed or agglutinated to the side, and that they require an exploratory celiotomy so that the tubes and ovaries may be put in a normal condition.

Dr. Thomas B. Noble, Indianapolis, Indiana.—Every practitioner appreciates the position he is in when he is called upon to restore maternal function when apparently it has been lost in times

gone by by short-sightedness, inadvertence, or sinful acts on part of the patient, but there is a danger associated with the restoration of the oviducts that must not be lost sight of, a danger which it is difficult to surmount even though you anticipate it, and that is an extension from the infection that possibly exists in the lumen of the tubes, which you are attempting to restore. In a given case following an abortion or abortions the tubes have been strangulated toward the fimbriæ by adhesive fibrils or by the closure of the fimbriæ by the agglutination of their dactyliform processes in such a way as to mechanically produce accumulations of discharges within the tubes. In this class of cases in which the tubes may appear capable of restoration, we are prone to the danger arising from liberated infection.

Three months ago in attempting to do what Dr. Reder suggests, a young woman who had married three years before and had had an abortion, and was unable to have a child, submitted herself to a laparotomy for the purpose of making her fruitful. I found such tubes as I have already indicated; they were closed at the fimbriæ, with but slight cobweb bands about them. I opened the fimbriæ, examined as much of the mucosa as I could and separated the adhesions by cutting, not by stripping, in order that there might be no denuded surfaces left, and then closed the woman's abdomen. She was dead in three days from a violent septic peritonitis.

I do not know any way whereby we can make a bacteriological study of this class of cases which would give us an insight as to the presence of infection in the tubes, old or new, so that we could determine whether to remove the tubes or leave them, hoping they might functionate later on.

Dr. James E. Davis, Detroit, Michigan.—The relation of the pathology of the uterus and adnexa to the physiological function is very interesting, and if we are to succeed by the operative measures offered by the essayist, it is necessary that they be done early.

One is impressed with the rapidity with which structural changes take place. Those who have examined tubes in sections will be reminded that the fimbriæ disappear in a surprisingly short time in many cases. There is quite a variation in the different types of infections. With the staphylococcus infections, perhaps the best results will be obtained and the least damage will be done, excepting in those cases where the accumulation of pus in the tube is enormous. In the streptococcus infections, usually the damage is very great in a short period of time. In the gonococcal infections, it seems there is a selective effect exerted upon the mid-portion of the tube. Where the gonococcic and streptococcic infections are together, then the function of the tube disappears very rapidly. In these tubes we find the fimbriæ cannot be identified after a short time. It is not a question of opening the ostium; it is one of absolute destruction of all functionating tissue remaining in the tubes. The extent of the endometritis also is a very important consideration. In nearly all these criminally produced abortions there is a very marked endometrial change, such a change that it is impossible for pregnancy to be successful at any future time.

Dr. Reder (closing).—With regard to the infections Dr. Noble speaks about, I regard time an important factor. Inasmuch as these infections were of long standing before an operation was undertaken, it could be assumed that the tubal contents were sterile. Time is our best ally in these cases. Again, we should take into consideration the fact that these women have not been sick; and that their resisting power was good.

With regard to the remarks of Dr. Davis, all the women that conceived were the youngest of the series. They suffered the least amount of damage as far as the induction of abortion was concerned. In many of these cases the fimbriæ could not be demonstrated at the operation. A dissection was made about the ostium of the tube till the lumen was reached. The end was then "cuffed" back. When we consider the migratory possibilities of the ovum some assistance can be given to the ovum by attaching the ostium of the tube as near to the ovary as can be done without causing undue injury to the circulatory apparatus of these organs, or if the ovary is prolapsed by relieving it of its adhesions and attaching it as near the ostium of the tube as possible.

THE IRVING W. POTTER METHOD OF PRACTICING VERSION.

BY

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Two years ago, Dr. Irving W. Potter of Buffalo, N. Y., reported to the American Association of Obstetricians and Gynecologists, 500 cases of internal version of the child for all causes, but especially for reasons not sanctioned by the learned obstetricians of the past and present, viz., shortening of the act of labor for the purpose of giving relief to the mother, of preserving the vitality of both mother and child, and of economizing the time of the accoucheur. Dr. Potter, at the time, claimed that his maternal and fetal mortality and morbidity were not only not greater, but considerably less than those obtained by the average obstetrician; that in the great majority of primiparous women, he did the operation without tearing the os, the vagina, or the perineum; and that his patients experienced no shock and recovered more promptly from the effects of labor than when they were subjected to the process of spontaneous delivery under the guidance of well-trained man-midwives who always are firm believers in faithful "watchful waiting."

The discussion which followed the reading of Dr. Potter's paper obtained little or no support of his views and of his practice. Indeed, Dr. Potter was flatly and unhesitatingly denounced; many of the Fellows present declined to believe him, and his paper was refused publication.

One year later Dr. Potter appeared again before this Association with the report of 200 additional cases of version performed by him during the previous year with hospital records and temperature charts of every case. The discussion following his second paper did not differ much from that of the previous year. But Dr. Potter was strongly supported in his practice by Dr. H. E. Hayd of Buffalo, who had witnessed several cases of version performed by Dr. Potter, and who had examined the patients, immediately after delivery, found them free from injury, and observed their prompt

and perfect recovery from the effects of labor and confinement. The second paper of Dr. Potter was recommended for publication by the Executive Council, and it was printed jointly with the first paper he had read on the same subject the year before. It cannot be said, however, that Dr. Potter's obstetric practice had found earnest supporters; indeed, nearly all present deprecated his views as to the justification of frequent version for the sole purpose of alleviating pain, shortening labor, and the saving of his own time.

I there and then determined to visit Dr. Potter and to witness for myself his method of performing version, and the conditions under which he did it, all of which were so eloquently endorsed and described by Dr. H. E. Hayd. On Monday, September second, while the guest of Dr. Hayd in Buffalo, the wished-for opportunity presented itself. During the month of August, Dr. Potter had personally attended 105 cases of labor; in 70 per cent. of these cases he delivered the patient by the aid of internal version and with the most gratifying results, and mostly for the reasons mentioned above.

When I met Dr. Potter to witness his work, on the evening of the second day of this month, he informed me that he had attended and delivered nine women within the last forty-four hours; and in nearly all of them he had resorted to version. About 8.00 P. M., Dr. Hayd and I met Dr. Potter in the Buffalo Deaconess Hospital for the express purpose of seeing him deliver by version, in an otherwise normal labor case. This was the tenth case within a period of less than two days.

Case I.—II-gravida, aged twenty-three; perfect in health; of good build and well nourished. Full-term pregnancy; abdomen very large; pleural pregnancy suspected; only one fetal heart faintly audible far to the right of the median line and below the level of the umbilicus; vertex presentation, head at the brim; cervix obliterated; os fully dilated; membranes intact; pulse and temperature normal. Version upon the feet was performed under complete chloroform anesthesia. The case proved to be a twin-pregnancy. The first child was delivered, hale and hearty, within ten minutes from the time the Doctor introduced his fingers into the vulva; the second child was born seven minutes later in the same manner. Each child had its own amniotic sack and placenta. The membranes of the second child were not torn during the turning and extraction of the first child. Both placentas were delivered by the Credé method, without traction upon the cord, within ten minutes after the second child was born. Duration of the operation, with labor completed in all its details: twenty-seven minutes. Indication for version: shortening the period of labor and duration of pain, the

preservation of the mother's and child's vitality, as well as saving time for the obstetrician. Weight of both twins: 14 pounds.

Case II.—Half an hour later Dr. Potter, his anesthetist, and his visitors, Dr. Hayd and I, were at the Buffalo Homeopathic Hospital, where Dr. Potter performed another internal version on a nineteen-year old I-gravida. This patient, too, was of normal build, and at the end of term; she had been in the first stage of labor from five to six hours; the os was fully dilated; the membranes intact; vertex presenting in the first position with the occiput at the brim. Patient's condition excellent; pulse and temperature normal. Indications for turning of the child as in the first case. Duration of the operation, including the delivery of both child and placenta, twenty-three minutes. An examination showed no visible or tangible evidence of injury to the mother's soft parts. Child living, strong, weighing 8½ pounds. The cord was twice around the baby's neck.

Description of Dr. Potter's Manner of Turning the Child In Utero.—While the patient is being chloroformed to the extent of total unconsciousness, Dr. Potter thoroughly scrubs his hands and forearms with soap and water, after which he puts on a long-sleeved, sterilized gown and skull-cap. He then places upon the left hand and forearm a long-sleeved rubber glove extending up to and slightly beyond the elbow; upon his right hand he wears an ordinary short rubber glove. He invariably uses his left hand to perform version, no matter what the attitude of the child *in utero* may be. The patient, in the recumbent position, is brought to the edge of the confinement table so that the buttocks extend slightly over the edge. Each leg is supported by a nurse. The thighs are not flexed upon the abdomen, as in the lithotomy position, but simply separated and held apart while the legs hang, loosely flexed in the knees, over the supporting arm or hand of the nurse on each side. The pubic, vulvar, and perineal regions have been previously shaved and rendered aseptic. The bladder is catheterized by the operator himself, and entirely emptied, if possible. After lubricating the rubber glove on his left hand and forearm with liquid soap, he proceeds first by dilating the vulva and perineum with the fingers of that hand, introducing one after the other, and effecting gradual dilatation of the parts by alternately spreading the fingers gently apart. In the short space of a minute or two, his hand is within the vagina. His first effort consists in carrying the uterus and child above the brim. This done, he begins to detach the membranes from and around the dilated os. If dilatation of the os is not complete, he introduces his whole hand into the lower segment of the uterus, then extends his fingers in every direction and withdraws the hand

slowly from the uterus. This maneuver is repeated until he has obtained full dilatation. His hands and fingers act on the principle of a Bossi dilator; the difference is that the hand is a better and safer dilating instrument. During the withdrawal of the open hand and separated fingers, he gently takes hold of the membranes and carefully pulls down the bag of waters, always taking care not to break it. To my surprise this maneuver was not attended by loss of blood in either of the two cases I witnessed.

As soon as full dilatation of the os has been secured, and complete detachment of the membranes within the lower uterine segment is effected, the membranes are ruptured and the left hand goes at once in search of both feet, while the right hand supports the uterus from above. When the feet have been found and have been firmly seized between the thumb, index and middle fingers, traction is made upon them, while the free hand upon the abdomen, immediately above the symphysis pubis, pushes the fetal head toward the fundus of the uterus. All of this is done in a quiet, gentle manner. The forearm of the operator closes the vulvar orifice and most effectually prevents the rapid escape of the liquor amnii until the lower extremities plug the os. In this way nearly all of the amniotic fluid remains within the birth canal. The feet, once at the vulva, are held there. The body of the child is expelled entirely by the contractions of the uterus. During the expulsion of the child's body, the operator merely assists in the rotation which Nature directs, and the shoulders are made to descend, dorsum anterior, in either the right or left oblique diameter of the pelvis. No traction is made upon the child while the body is being delivered. A piece of gauze is placed between the legs of the child to catch any meconium that escapes from the anus. When the shoulders of the child have arrived within the pelvic cavity, the operator rests the body of the child upon his left hand and forearm, and covers it with a warm cloth. With the index and middle fingers of the right hand the arms of the child are brought down as soon as the scapula shows under the pubic arch, first the anterior one, and then the posterior. When this is accomplished, he directs the legs of the mother to be lowered until they are almost in a Walcher position; and then with his right hand the flexed head is pressed into the pelvis from above, while the index finger of his left hand, placed in the child's mouth, makes gentle traction upon the head from below. Flexion of the head is thus not only favored, but increased, and with little effort the lower half of the face is brought to the vaginal outlet. The body of the child is now extended toward the mother's abdomen, thus exposing

the child's throat, which is gently stroked with the index finger from the chest toward the mouth, for the purpose of emptying the trachea and esophagus of blood and amniotic fluid the child may have swallowed or sucked in during efforts of premature respiration. If the head admits of easy evolution, it is delivered at once; if not, Dr. Potter is in no hurry, because the child can breathe freely with the mouth exposed at the vulva, and the mother is in no danger whatever. In the two cases above described, the heads were promptly born. Should there be undue delay at this state of birth, the forceps can be applied without difficulty and the head extracted without injury to it or to the mother.

The head delivered, the child is placed upon the mother's abdomen and covered with a fresh, warm cloth. The cord is not tied and cut until its pulse becomes weak or has ceased to beat altogether. The third stage is terminated with the aid of the Credé method. Dr. Potter gives the uterus ample time to contract and makes no traction upon the cord. A hypodermic injection of ergot is now administered, after which the patient is dressed and put to bed.

One of the remarkable features observed in the delivery of the two cases witnessed was that Dr. Potter's gown, clothes, and shoes were as clean after the operation as before. The floor of the operating room, too, was free from blood and amniotic fluid. The patient's body showed no blood stains. The method of keeping the patient, the nurses, and the physician so immaculate throughout the operation lies in his placing a thin pad of several layers of moist aseptic gauze over his left forearm directly in front of the vulva while he was performing the version. When, occasionally, a little blood escaped sterile water was poured from a pitcher over the vulva and perineal regions. The patient's buttocks rested upon a rubber-pad which ended in a tub on the floor. Both patients awoke immediately upon the termination of labor, and neither of them, nor Dr. Potter, seemed in the least fatigued.

Comment.—It would be entirely out of place here to discuss the numerous and well known indications for internal version. The principal question involved in Dr. Potter's almost daily, if not hourly, practice of obstetrics, is this: *Is the operation of internal version of the child justified in cases of normal labor without the presence of a sign indicative of danger to the health or life of either mother or child?* It is not too much to say that every well-trained and conscientious obstetric teacher and practitioner, the world over, to whom Dr. Potter's practice is made known for the first time, will exclaim without a moment's hesitation, that internal version of the child

is never justifiable in cases of perfectly normal labor, in the absence of any or all of the usually and generally accepted indications for this obstetric procedure. Every one who knows anything of the art and science of midwifery, will at once feel that he must earnestly protest against the introduction of an obstetric intervention so utterly at variance with the established teaching and practice of midwifery of the past and present. Indeed, the whole profession will stand a solid bulwark against this practice, *but not forever; of this I am certain now.*

What is there to be said in favor of Dr. Potter's practice? The shortening of the duration of labor, and the consequent early relief from pain and suffering, as well as the maintenance of the patient's strength and power of recuperation, are certainly points worthy of the most earnest consideration. The saving of time, and the securing of rest and sleep for the accoucheur, while of secondary import, should not be lightly regarded. Is it not true that many of our best general practitioners and gynecologists do not accept care of obstetric cases because of the enormous sacrifice of time, small pay, and great responsibility involved? Most medical men seek other and more lucrative specialties for their life-work. Dr. Potter's method of practicing obstetrics will do away with many of the objectionable features just stated. His method will invite, rather than repel, men to become specialists in this department.

But are there no other conditions which might result in benefit for the patient and her child by resorting to an early version in cases, apparently, perfectly normal in every respect? What of those instances in which, after an easy and spontaneous labor under strictly aseptic precautions, a sapremic or septic infection of the parturient tract results from even a comparatively brief exposure of the amnion or its cavity, to the saprophytes and other microörganisms which are always present in the lower third of the vagina, in spite of the best means employed to dispose of them prior to labor? In a case of this kind an early version and delivery of the child might prevent a profound and fatal infection of both mother and child. The same might be said of those cases in which an infection of the amniotic cavity occurs through the maternal circulation, or when disease germs reside within the Fallopian tubes which find their way to the ovum. Again, an early version in a case in which no disproportion between the parturient canal and the child is suspected, but does, nevertheless, exist, will be of the greatest advantage to both mother and child. The use of forceps, which later might have become necessary under such circumstances, will thus have been unwittingly

avoided, together with all the unpleasant and sometimes even dangerous consequences which frequently follow in the wake of forceps delivery.

However, the crux of Dr. Potter's practice in resorting to frequent and early version, in the absence of the generally accepted indications, lies in the fact that he not only does no harm, but actually benefits both mother and child. Curtailing labor pains and the conserving of strength of both lives concerned, are strong arguments. Dr. Potter states, and I believe him, that since he resorts frequently to early prophylactic version, he has observed fewer injuries to the mother's soft parts, such as lacerations of the cervix, vagina, and perineum, than in his former years of practice. We all know with what frequency these injuries occur under the ordinary and well established rules of practice. More than that, if Dr. Potter demonstrates beyond a doubt that version may be resorted to, in normal cases of labor, not only with impunity, but to the distinct advantage of all concerned, the procedure necessarily finds its justification in this alone. If Dr. Potter is able to perform internal version with a dexterity and gentleness free from danger to mother and child, and for their benefit at the same time, there is no good reason why others should not be able and willing to do the same. Think of a man personally attending and delivering safely eleven women within forty-six hours, in different hospitals and homes, and still finding time to eat, drink, and sleep.

My advice is: Go to see Dr. Irving Potter, witness his work, and judge for yourself. It is said: "the proof of the pudding lies in the eating of it." Women who have had the benefit of Dr. Potter's obstetric services want him again. There may be some exceptions, but they only prove the rule. In my opinion Dr. Potter has taught us a lesson. Buffalo, N. Y., will be henceforth a Mecca for the young and ambitious obstetricians. Opposition to Dr. Potter's practice will be universal, severe, and, probably, vicious. We should all heed what will be said against it, but whatever the nature of adverse criticism, let it be just and, above all, devoid of bitterness.

DISCUSSION.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I wish to compliment the scientific spirit which prompted Dr. Zinke to investigate this matter of version. His presentation of the value of that procedure is such that it requires no further comment. After listening to this paper, I am sure the work of Dr. Potter will be precept to those who practice midwifery.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—I have often observed in many families that the first born was not 100 per cent. efficient, and where there are a number of children in the family the last was the brightest, cleverest and most genial. I have been told or have read that compression of the brain leads to petechial hemorrhages in the cerebral tissue. The obstetrician is thinking only of tearing the perineum. The father, the mother, and family want a baby with 100 per cent. efficiency in every brain cell; they do not care whether the perineum is torn or not, and should not care, because any obstetrician can sew that up, but you cannot repair damaged brain tissue. In Cesarean section you have the possibility of 100 per cent. efficiency of the brain, and, from what has been said, with short compression of brain you have a quick delivery. You have next following the Cesarean section a better, eugenically speaking, child than by the old process, and this feature pleases me.

Major J. Henry Carstens, Detroit, Michigan.—I have delivered a large number of women from time to time, probably five or six thousand, and consequently I have done many versions, and in the class of cases described by Dr. Zinke you can resort to version very successfully. However, there are some cases where you cannot do it. I cannot see how Dr. Potter with his hand and fingers can open the cervix in ten or fifteen minutes when it takes hours and hours to do it by other manipulations.

Dr. Zinke.—He does not interfere until the os is fully dilated or easily dilatable.

Major Carstens.—It takes quite a time to dilate the os. I have no doubt it is very good practice in some cases, especially in multipara, but in primipara, in the hands of men who have not a very large experience, I would suggest that they do not try it. All things considered, I think relying on the *vis medicatrix naturæ* is the best way. In cases where there is a normal presentation, and the women are going on in a normal way, you had better take a chance with nature.

Dr. Arthur H. Bill, Cleveland, Ohio.—I am still a skeptic and am not at all convinced. There are several points to be considered, one of them just mentioned by Dr. Carstens in connection with Dr. Zinke's paper pertaining to the dilatation of the cervix. It is said that the cervix is dilated by Dr. Potter without any injury whatever. I do not believe that it is possible for a cervix to be dilated rapidly with the fingers in a safer way than it can be dilated by the membranes or fetal head. There is certainly danger in dilating the os rapidly in cases in which it is not completely dilated, especially in primiparæ.

I can remember in my hospital experience as a student seeing versions done in various clinics in which this was considered the proper procedure. I think I can truthfully say more babies were lost by version than by any other obstetric procedure, particularly in cases in which there was faulty judgment on the part of the operator in choosing to perform version, where there was a slight

disproportion between the head and pelvis. To be sure versions are done by good men, men who are considered good clinicians, who think they can deliver a baby by means of version better than they can by forceps, but where considerable traction is exerted on the aftercoming head the fetal mortality is high.

Version is a bad procedure in cases in which there is a disproportion between the fetal head and pelvis. There is only one type of pelvis in which it is possible to deliver the aftercoming head in an easier manner than the advancing head, and that is the simple flat pelvis of normal width. I do not believe that one can deliver the aftercoming head with greater facility than the presenting head in any other type of pelvis. There is no molding the fetal head in cases in which version is performed by Dr. Potter, and molding means much in the delivery of a case in which there is a moderate disproportion between the fetal head and the pelvis. I personally am doing fewer versions now than I did ten years ago because there is seldom an indication for podalic version. In my opinion there was no indication for version in the two cases reported by Dr. Zinke.

As to saving Dr. Potter's own time no comment is necessary. As to eliminating the bulk of the labor and also avoiding injury to the fetal head, why stop at version? Why subject the patient to any part of labor? Why not do a Cesarean section in every case and be done with it and, in addition, have a perfect baby in each case?

Dr. William M. Brown, Rochester, New York.—I do not see any danger in this method in Dr. Potter's hands or in the hands of any Fellow of this Association, but I do see one danger at the present time in this proposition. You know that probably 75 per cent. or more of the labors are not in your hands or my hands, but in the hands of the very plain ordinary practitioner. If this proposition goes out from this Association and is advocated as a proper procedure for every one to do, it will let down the bars; the practitioner in the country who is in a hurry, will do a version, and you will find that there would soon result an enormous morbidity and mortality if this thing should be universally adopted. The danger I see in it is not on account of its practice by Dr. Potter or the members of this Association, because they can in a hospital under proper conditions do these versions safely and well, but the question arises, is it safe teaching for the large run of general obstetric practice throughout the country? I do not think it is.

Dr. C. Hollister Judd, Detroit, Michigan.—From what Dr. Zinke has said, I believe Dr. Potter is correct in his statements and has done what he claims. Dr. Potter has acquired tremendous skill by long practice in this difficult procedure; I do not believe I could be anything like as skilful as he is. If he taught me, I might do version better than I do it now. If this procedure is advocated and it goes all over the country, and men are not conscientious in doing it, it is capable of doing tremendous damage. I have done a great many versions and perhaps I do the operation rather crudely, but I have learned to do them slowly and carefully, I try to have the baby breathe, and not extract the head when it comes to the outlet. As

I have remarked, Dr. Potter has acquired great skill in this operation, but how much damage he did in acquiring that skill it is hard to say. I feel that we may do more damage than good in acquiring that skill, and that it is safest for most of us to go carefully.

Dr. Abraham J. Rongy, New York City.—Two years ago I refused to accept Dr. Potter's teaching and said so. A year ago I refused to accept his teaching with Dr. Hayd's endorsement, and this year I refuse to accept it with Dr. Zinke's endorsement. I will go one step further than Dr. Brown and say that I do not believe 50 per cent. of the men in this room can do what Dr. Potter does. I believe Dr. Potter and believe in what he says, but half of the men in this room cannot accomplish what Dr. Potter has accomplished in the last three or four years. If we should permit this teaching to go out from this Association and be disseminated throughout the country, it would do more damage than any other obstetrical procedure within my memory. I know that I cannot perform version as well as Dr. Potter describes it, with the least amount of danger to the woman and child. I have tried to follow his technic in the last year and I did not save the perineum. In many patients the shoulders were extended above the brim of the pelvis; I had to introduce my hand and bring the arms down. There must be a certain amount of tearing of the soft parts. Like many others, I would like to see Dr. Potter do this work. We ought to be more conservative and not allow teaching of this sort to be disseminated broadcast. We *must* not use prophylactic version for the convenience of the doctor.

Dr. Irving W. Potter, Buffalo, New York.—I want to thank Dr. Zinke for coming to Buffalo. I did not know he was coming, and his visit was rather a surprise to me. This paper was still more of a surprise. He saw me do two versions and watched me very carefully. Both of those patients and babies are well.

At the Indianapolis meeting two years ago I received a sound thrashing. I reported 500 cases of version which were my own work. I had absolutely disregarded everybody's teaching, but I was perfectly honest in my statements, and the health reports of the city of Buffalo are open to anybody's inspection at any time, and if I did not get such results as I reported I would not be allowed in the hospitals which the city of Buffalo supports; neither would I be allowed to go on with the business that I am doing. The 500 cases I reported at Indianapolis were not very well received. I appeared before the Association at Newark with a series of 200 cases the year following the Indianapolis meeting, and that paper was published after considerable discussion, and I was told that that would be the end of it.

For the year ending August 31st, I have personally delivered 746 women. My assistant is in Europe in the service; two other men I have had with me are gone, and this work has been done by myself. Of these 746 women, I delivered 508 by version. The year before I reported 200 cases and was told I would have to stop, and this year I have reported 508. That makes a series of over 1200

versions without a maternal death, and with a fetal mortality less than I would have had by other methods.

I was told at Indianapolis and at Newark that I had brought nothing new to the Association. While I may have brought nothing new, nevertheless my method is distinctly different from any method of version I have read of or heard anybody describe, and the trouble with the whole situation has been that the paper was never properly discussed.

In the first place, I advocate deep anesthesia. I do not believe there is any place in obstetrics for the so-called obstetric anesthesia. I have a regular anesthetist who goes with me and does nothing else. In the second place, the proper position of the patient is of the utmost importance. This work cannot be done on a low double bed, it can be done on a high single bed, or it can be done on an ordinary kitchen table. Deep anesthesia and proper position of the patient are two very important essentials. I said the cervix must be dilatable or dilated. I know when a cervix is as thick as my finger I cannot dilate it and I do not try. I do not want anybody to go away with that idea. The cervix must be dilated and must be completely dilated to have a successful termination of the version. The anesthesia, the proper position of the patient, and complete dilatation of the birth canal, Dr. Zinke has described most accurately.

Another point which is of the utmost importance and which is not described in your text-books, or was not described by any of my teachers, or advocated by anybody, is bringing down both feet. All the versions I saw when I was a medical student or heard talked about were those where the obstetrician reached up and pulled down one foot, plugged the outlet with one hip. If he got the posterior foot, the anterior hip caught on the symphysis, and if he got the anterior leg the posterior hip caught on the promontory, and he either went away and left it there or pulled the leg off. I bring down both feet, then have complete control of labor. It can be terminated as abruptly as you like without any damage to either one hip or the other because traction is equal; you do not dislocate the hip or break the leg. Those points were never mentioned in this discussion. The Association merely condemned it. I am not talking to medical students; I am talking to teachers of obstetrics, and you cannot teach students so that they can do the work in a short time. It requires practice. My assistants can now do version as well as I can.

I do not go after the shoulders until the scapula is out. I bring the scapula down underneath the symphysis; I rotate the back of the child to the front by making a little traction on the anterior leg. Then you get the scapula outside of the body and bring one shoulder down with the forefinger. You do not put your arm alongside of the baby the way Dr. Rongy describes. Of course, he tears the birth canal. Now, when you get the anterior shoulder out, go for the posterior. It is a good deal easier to get the anterior shoulder out first than it is the posterior, the same as it is when you deliver the

anterior shoulder with the oncoming head; if you work the anterior shoulder out you can save the soft parts by lifting it up. Get the anterior shoulder out and posterior shoulder out, and put the left forefinger in the mouth of the baby, flex the head with the aid of the hand on the outside, and bring the mouth down to the vulva.

With all the versions I have seen done, the trouble has been that the operator is in too much of a hurry. He gets hold of the first thing he can find and pulls. That is all wrong. Get the mouth of the baby down to the vulva and let the baby breathe; milk out the mucus from the larynx if necessary. There is no hurry. The cord may be two or three times around the neck. Even if you make gentle pressure from above to increase the flexion, the baby will come out over the perineum all right.

These patients do not bleed severely. I have not had a patient bleed to death, nor have I had severe hemorrhages. The loss of blood in these cases is not any greater than it is with normal deliveries; I do no think it is as great many times. But the great secret of success is to familiarize yourselves with your position. You must introduce the hand and map out where the placenta is, separate the membranes from the uterine wall, and get as complete separation as you can before you do version. That facilitates the delivery of the placenta. When you do a Cesarean section, you introduce your hand and separate everything because it facilitates the third stage. You do the same thing with version, get the location of the child, find out where the child's cord is and the placenta, and explore the whole uterine cavity.

Just one point more. I do not think every man is constituted physically to do version. I do not think a man with a forearm as big as some of the forearms of the men in this room have any right to put it in a birth canal. A man with a long slender forearm and long gloves, properly lubricated, can explore the uterine cavity just as a surgeon explores the abdominal cavity without doing any great harm.

Dr. Zinke (closing).—Regarding conservation of the patient's strength Dr. Bill compared the statements in my paper on version, with Cesarean section. In Cesarean section the obstetrician mutilates the patient by invading the abdominal and uterine cavities through large incisions. A version does not necessitate anything like this procedure.

As to the danger of frequent version on the part of the general practitioners, it may be said that this applies with equal force to everything we do in the practice of medicine and surgery. He who does not know how to do a thing right, has no business to do it at all. It is true that many men perform operations for which they have not been trained. There is no longer an excuse, in these days, for such occurrences. In the past, when nearly every practitioner was a pioneer, experimentation was justifiable, but that time has passed. The discussion of to-day reminds me a little of what was said when I first advocated Cesarean section for placenta previa. There was not a man in the audience who agreed with me; and, subsequently,

I was roundly condemned by the medical press in this country and abroad for advocating this operation.

There was a time when everyone denounced hysterectomy and oöphorectomy. It took men like Joseph Price to establish these operations in this country. Ovariotomy and appendectomy were viciously denounced; and this has been the case in the past with every operation of importance. To-day all of these operations are performed daily, not always with good results, it is true, but with the consent of everybody. A man who cannot perform version of the child as Dr. Potter does, should not attempt or condemn the procedure; but one who can do it as well as Dr. Potter, need not hesitate to perform it, if, by so doing, he injures neither mother nor child, yet shortens the period of suffering and maintains the vitality of both lives concerned. A man must be educated for this practice. Good obstetricians, I think, like good surgeons and artists, are born. They have the material in them. All they need is a conscientious and efficient teacher to lead them on.

CESAREAN SECTION UNDER LOCAL ANESTHESIA.

BY

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THE sole purpose of this very short paper is to call attention again to the great value of local instead of general anesthesia in certain types of cases where abdominal delivery is indicated. At times there arises in a given case a combination of complications which leaves us but small choice of procedure in order to achieve a successful result. That we have been slow to recognize this situation is borne into my mind when I recall how, only a few years ago, I watched one of our foremost teachers in obstetrics do a Cesarean section in a patient with a contracted pelvis; and then a few days later saw him put a patient who had a dilated heart on the same table and attempt a manual dilatation under a general anesthetic. This patient died undelivered after twenty minutes' manipulation.

We are in a position now to say that, in certain types of cases, abdominal delivery, under a local anesthetic, offers the safest means of terminating pregnancy, and that this method is entitled to a definite and permanent place in our records of progress.

In a general way the patients in whom this procedure is indicated are those in whom, by reason of some intercurrent disease, a general anesthetic is contraindicated, and for whom a difficult labor is unsafe.

At this time I would divide these cases as follows:

1. Patients with advanced cardiac disease, in whom there is actual or impending muscle relaxation. These cases, if there is fair compensation, will often go, under careful hygiene, to the final weeks of pregnancy; but these patients are in no condition to undergo even the shortest labor; nor is the relaxation of a general anesthetic safe. The child is viable and active; the mother, relieved of the strain of her pregnancy, has a prospect of fair health for some time. These cases are entitled to abdominal delivery under local anesthesia. To illustrate the possibilities of this procedure under such circum-

stances, I will cite the actual conditions of a case in my hospital service.

Mrs. Julia K., aged thirty-three, white, para-iii. Her family history and personal history of early life were negative. She had one labor, at term, fourteen years ago; and one miscarriage, of four months' gestation, seven years ago. A mitral stenosis had been recognized a year before, and she was a severe sufferer from asthma. She was admitted to my service on December 29, 1916. At the time of admission to the hospital there was marked decompensation.

Present pregnancy dates from April 1, 1916, and fetal movements were first noticed late in August. The pelvis was ample with measurement between spines, 24 cm.; between crests, 27 cm.; ext. conj., 20 cm., int. conj. not taken. Uterine contractions began on December 31, 1916, and continued with fair regularity and moderate severity until ten o'clock in the morning of January 1, 1917, a period of eighteen hours, at which time I saw her. She was in a desperate condition, suffering from intense dyspnea, and having a pulse scarcely perceptible. While the labor had been severe enough to jeopardize her life, there was no engagement of the head and very little dilatation of the cervix. The child was alive with a fairly loud but slow heart beat. The whole aspect of the case was so grave that it was deemed advisable, in the interest of the child, to deliver by abdominal section. This we did under local anesthesia, and without moving the patient from her bed. Inasmuch as the prone position was impossible, the operation had to be performed while the patient was in a sitting posture.

Under heroic treatment with strophanthus and digitalis, a fair muscle compensation was obtained, and, much to our surprise, the patient was able to leave the hospital in good condition. She has since remained in fairly good health.

2. Patients suffering from severe toxemia, hepatic and renal insufficiency, and impending eclampsia. For some time abdominal hysterotomy has been growing in favor with many obstetricians in the treatment of these cases. With no intention of discussing the merits or demerits of this operation for the relief of profound toxemia, I may say that we do, occasionally, meet with a case of this kind in which this form of delivery is positively indicated, and for the same reasons local, instead of general, anesthesia should have the preference.

This type of case is well illustrated by the history of Mrs. R. F., aged twenty-eight, primipara. The estimated date of confinement was December 20, 1917. On the twentieth of November she came into my office complaining of a severe headache. There was considerable edema of the lower extremities, which had been rapidly increasing for three days. Her arterial tension was $^{196}/_{112}$, and she exhibited all signs of toxemia. More than 7 per cent. of albumin appeared in the Esbach tube, and many casts. She

was immediately sent to the hospital, and placed under energetic treatment, consisting of magnesium sulphate, until a continuous liquid flow from the bowel was obtained, then colon irrigations of bicarbonate of soda solution, and, finally, bleeding from the arm followed by a saline transfusion. In spite of these measures the patient grew worse. The blood pressure went above 230, systolic. The lungs were fairly waterlogged, and breathing was difficult. Eclampsia seemed impending. The child was living. Pelvis, medium-sized. Labor had not yet begun. I felt that pelvic delivery would be very slow, difficult, complicated by eclampsia, and that the child would be sacrificed. Cesarean section, under local anesthesia, was chosen and proved successful. The mother had several convulsions which began about four hours after delivery. Except for a mild phlebitis, recovery was uneventful.

3. A third complication which may render abdominal delivery under local anesthesia desirable is pulmonary tuberculosis. There are many aspects of the subject of tuberculosis in relation to pregnancy; but as it is not within the province of this paper to enter into a discussion of the subject at large, I simply wish to call attention to the fact that a combination of circumstances may arise which may render abdominal hysterotomy, without general anesthesia, a preferable procedure, as the history of the following case will indicate.

Mrs. T., para-iv, aged thirty-three, white; was sent into my service from a tuberculosis hospital. She was in her thirty-third week of pregnancy; suffering from advanced pulmonary tuberculosis, involving most of the right lung, and had had several hemorrhages. The last one had been very severe and had occurred about three weeks before her admission to the hospital. The doctor at the sanatorium sent word that the patient might have a fair chance of recovery if the uterus was emptied at once, but that she could not stand a hard labor, and, above all, that she must not have an inhalation anesthetic.

Believing that her previous labors, and the present small child, would make pelvic delivery possible with a minimum of risk and pain, I introduced a No. 3 Voorhees bag and made intermittent traction. The bag came through the cervix in seven hours without inducing labor. A reconsideration of the case led me to decide on the abdominal route under local anesthesia. This was done, after four days of rest for the patient, and the necessary preparation for the operation. The result was satisfactory. The patient has gained more than 10 pounds since the operation and is rapidly improving in general health.

The above histories were chosen from my records because they are illustrative of the results that may be achieved in properly selected cases, and favorable environments.

When an obstetrician performs this operation under a local

anesthetic, two important elements are necessary for success. The first is in securing the confidence and coöperation of the patient; the second is thorough infiltration of the operative area and delicacy of manipulation of the exposed tissues and organs involved in the operation. No matter how careful one may be, it is impossible to block all of the underlying nerves, and the patient passes quickly from an endurable discomfort to unbearable pain. It is not difficult to anesthetize the abdominal wall so completely that the peritoneum may be opened without appreciable pain. The fundus of the uterus is without sensation and may be incised without the knowledge of the patient. The pain results, principally, from dragging upon, and manipulation of, the uterus and the intestines. The operation is ideal if done without soiling the peritoneum, and bruising the organs and tissues with which the operator comes in contact. With these requisites in mind I have formulated the following method, and have employed it advantageously for several years. After the abdomen is opened and the uterine incision is partly made, the uterine wound is fastened to the abdominal incision with four or five ordinary towel clamps. These clamps hold the uterus to the abdominal wall, and prevent the blood and amniotic fluid from entering the peritoneal cavity. In this manner traction upon the uterus is prevented; the clamps are not removed until the uterine wound is nearly closed. This method, too, makes it unnecessary to pack gauze into the abdomen to hold back the intestines.

Local instead of general anesthesia should not be a routine procedure in this operation any more than in other major operative procedures. A careful consideration of the patient's condition and her surroundings must prompt us in our judgment as to which is the best practice to pursue in each individual case.

INDICATIONS FOR CESAREAN SECTION, WITH A RECORD OF PERSONAL EXPERIENCES IN A SERIES OF 109 CASES.

BY

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Fifteen years ago the average medical student very often completed his medical education without witnessing the delivery of a child by Cesarean section. At that time the operation was undertaken only by men of large experience. It was performed either by the professor of obstetrics or by an experienced surgeon in a large maternity hospital. The operation was announced some time in advance, and the preparation for it was really magnificent, assuming almost the aspect of a drama. The operator and his retinue of assistants felt that they had a responsible task before them, and usually performed it well. The greatest care was taken that every detail of the technic should be properly carried out. Everyone associated with the operation felt relieved when it was over, particularly when both mother and child survived.

In those days the indications and contraindications for the operation were carefully weighed by competent men. Very seldom was a patient subjected to this operation hastily. Conservatism permeated the entire obstetric profession, and as a result Cesarean section was resorted to only when the physician was certain that it was the best method by which a living child could be delivered. Can the same thing be said of present-day obstetrics? Has not the pendulum swung the other way? Is there not a subconscious feeling among the older obstetricians that the indications for Cesarean section are not carefully weighed, and that it is not infrequently performed when another method of delivery would bring about the same result?

Personally, I feel that the abdominal route of delivery is followed too frequently, not only in metropolitan districts, but also in the smaller communities. Technically the operation is so easy that every tyro in surgery undertakes it. Surgeons who are not capable

of performing a simple hernia operation will attempt to do a Cesarean section. The immediate results to mother and child may be good, but the fact that the future pregnancies of the patient are endangered does not seem to enter into the minds of these semi-trained surgeons and obstetricians. A note of warning of this danger has been sounded by many of our able obstetricians; but, it seems, without effect. The reports of large series of cases of this operation, coming from obscure men and unknown hospitals, are certainly on the increase. Such reports tend to stimulate others to follow this practice. The average surgeon, however, is not sufficiently critical in his analysis of the cases brought to him; he draws his conclusions too readily, is very easily convinced, and proceeds to operate. It seems to me that the responsibility for the accuracy of many of these reports should be placed somewhere. Some able and responsible body should sit in judgment of the work in the field of obstetrics, and an attempt should be made to standardize it. If the present conditions are allowed to prevail, the practice of obstetrics will be brought into disrepute, not only among the medical profession, generally, but also among the laity.

The unpublished results of Cesarean section, performed throughout the smaller communities, must be appalling, if Newell's statistics are taken as a criterion. He recently investigated the result of abdominal section in a number of small cities near Boston, which have a population of from 25,000 to 40,000 inhabitants. In the first city quoted, not one of the patients on whom Cesarean section was performed is known to have recovered; in the second, the mortality was from 60 to 75 per cent.; in the third, Cesarean section is believed to be a universally fatal operation when performed by the local surgeons; in the fourth city, Cesarean section has a maternal mortality of from 10 to 20 per cent.; but since it has been adopted as the routine method of delivery in eclampsia, the mortality has been increased to over 50 per cent. Newell further states that the majority of operators, apparently, select Cesarean section as a panacea for all obstetric difficulties, and then they blame the patient, or someone else, for the unfavorable result. They appear oblivious to the fact that the fault lies with them, and that there are certain factors which render the operation safe, when observed; or extremely dangerous, when neglected.

R. W. Holmes openly states that too many Cesarean sections are performed for practically no reason of scientific worth. He maintains that, no matter for what purpose a Cesarean section may have been done, the presence of the uterine scar is a source of great risk

to the mother, and it alone demands hysterotomy in all subsequent labors. We might quote many authorities who believe that nowadays obstetricians have recourse all too frequently to the abdominal route of delivery.

My experience with this operation consists of 109 cases, eight of whom died. Seventy-four patients, upon whom eighty-two sections were performed, were first seen in consultation with the family physician. All of these patients had been in labor from two to twenty-four hours, or longer. The remaining twenty-seven sections occurred in my own practice, and were performed on twenty-two patients. That I have always been conservative in choosing the abdominal route, may be judged by the fact that, during a period of twelve years, I saw, approximately, 1,500 labor cases in consultation, all having some form of dystocia, which made the attending physician anxious, and that in only eighty-two of them Cesarean section was performed.

The same is true of the cases in my own practice. Out of the large number of patients that I attended during the same period, Cesarean section was performed twenty-seven times. During the years of 1915 and 1916, I attended approximately 800 labor cases.

It will be seen that the indications for the operation were not controlled by hard and fast rules. Very often I was compelled to perform this operation against my better judgment, and was seldom able to adhere to the classical indications. The one important factor which influenced me for or against Cesarean section was the asepsis and antisepsis of the family physicians. Most of them were personally known to me; and I never, but once, performed abdominal section in the practice of one who, in a general way, could not be relied upon for his antisepsis and asepsis. However, I feel that no matter how carefully a patient has been treated by the family physician during labor, the risk of an abdominal section after many examinations have been made, whether at home or in the hospital, is always greater. The mortality in this class of patients is over 15 per cent.

The chief reason for this extensive mortality is the neglect of prenatal examination and proper care of the patient by the general practitioner. If our undergraduate and postgraduate schools would teach the student how to measure properly the diagonal conjugate diameter, the practice of obstetrics would immediately be raised to a higher plane, and the lives of many patients would not needlessly be placed in jeopardy.

The average practitioner does not seem to have the least con-

ception of the importance of knowing the relation of the fetal head to the pelvis. If we could convince the family physician that the fetal head must be found engaged in the pelvic basin in every primipara, at term or in labor; and that, in the absence of it, labor immediately becomes pathologic in character, he would realize that such a delivery could be successfully managed by a competent specialist only.

In the above series of cases Cesarean section was performed for practically all of the obstetric emergencies, and included the delivery of an unusually large, dead fetus, weighing 16 pounds. The operation was performed ten times for eclampsia in patients in whom the pregnancy had advanced beyond the thirty-sixth week. All of them had three or more convulsions. Eight mothers recovered.

The treatment of eclampsia still furnishes ground for prolonged and animated discussions. The pendulum of opinion is swinging to and fro. Apparently we are not able to determine, satisfactorily, whether the conservative or radical plan of treatment is the better. At present eclampsia is being treated more conservatively, and nature is given a chance to act in her own behalf.

In my own treatment of eclampsia, my practice is more conservative now than it was three or four years ago, though after attending a large number of cases, one is not easily frightened by convulsions. However, I feel that Cesarean section has a definite place in the treatment of eclampsia. If the cases are properly selected, no plan of treatment, now known to us, can take its place, especially when the life of the child becomes an important factor. I do not suppose that many of us remember the days when the delivery of a living child was as important as it is now. The responsibility of the obstetrician during the past year has been greater than ever.

Women seized with convulsions after the thirty-sixth week of pregnancy, who are not in labor, whose cervix is thick and long, and who do not respond promptly to medical treatment, should be delivered by Cesarean section. Such patients, if not too toxic, usually recover. The chances for a viable child are also better. Cesarean section has no place in eclampsia when labor has already set in; in such cases, the administration of large doses of morphine is the best treatment. Cesarean section has no place in the pre-ëclamptic stage, for in these cases the induction of labor is followed by the best results for the mother.

Nine instances of placenta previa occurred in the above series of cases. Seven of the mothers recovered. One of them died of

gangrene of the uterine wound, resulting in general sepsis. Post-mortem examination showed sloughing of the uterine wall, beginning at the lower angle of the incision. This patient bled for about three weeks prior to her admission to the hospital, and was the victim of severe secondary anemia. She was in the thirty-seventh week of gestation. The cervix was long and closed; it was impossible to locate the implantation of the placenta. It seemed to me that, in this particular case, the safest method of delivery for both mother and child would be abdominal hysterotomy. The severe anemia in this case prevented union of the uterine wound. The other patient also died of sepsis on the sixth day following the operation.

The treatment of placenta previa requires the experience of more judgment than any other obstetric complication, for in no class of patients is the immediate outcome of the case so uncertain. It is tragic how helpless we are in some of these cases. We have at present no method by which we can control the bleeding, particularly after labor has begun, no matter what the locality and character of the placenta previa. Some of these patients succumb before we have time to institute any therapeutic measure.

It seems to me that some patients, if seen early, and before they lose too much blood, are best treated by Cesarean section. This fact is particularly true of patients who are pregnant for the first time, who are near or at term, who are not yet in labor, and who give a history of an irregular small amount of bleeding two or three weeks prior to a sudden and severe hemorrhage, but who are still in good condition.

Permit me to cite a case that impressed me, particularly, with the value of Cesarean section in placenta previa:

A woman in the ninth month of pregnancy was admitted to the hospital with a history of severe bleeding. The house surgeon notified me immediately. Within an hour I reached the hospital, and found the patient upon the operating table, but not in labor, deeply cyanosed, and with a scarcely perceptible pulse. I felt this patient must be delivered immediately if her life was to be saved. Abdominal section was performed practically without anesthesia. To my great surprise, the patient rallied promptly after the operation, and made an uneventful recovery. I am certain that in this case the rapid evacuation of the uterus, and the tight packing of the lower uterine segment from above, to prevent postpartum hemorrhage, saved the mother and child. I doubt whether any other method of delivery would have accomplished this result.

In performing Cesarean section for placenta previa and eclampsia, the obstetrician must take greater care in dealing with the uterine

wound. In these patients the tissues are more or less devitalized, and union of the wound is delayed, or does not take place at all, along the incision. To prevent this condition, the surfaces must be carefully approximated and made to coapt without much pressure to avoid strangulation of the tissues.

Cesarean section was performed in eight patients in whom forceps delivery had been attempted by the attending physicians. All of these patients were victims of contracted pelvis. One, a para-iii, had been previously delivered by the high forceps and by craniotomy. In this, her third labor, the physician patiently waited for the birth of the child for more than twenty-four hours. Twelve hours after full dilatation of the cervix he applied the forceps. He called another physician to assist him. Being unable to introduce the first blade of the forceps, he sent for a third physician to aid him in his dilemma. The last doctor succeeded in introducing the first blade, but could not adjust the second blade so as to lock the forceps. After spending some time in fruitless efforts, he came to the conclusion that the patient should be sent to the hospital. He succeeded in removing the second blade of the instrument, but was unable to remove the first. I was then sent for, and found the patient, thoroughly anesthetized, with one blade of the forceps protruding from the vagina. After removing the blade I sent her to the hospital. The patient, in spite of all she had endured, was still in good physical condition. The child was viable and uninjured. No traction upon the forceps had been made. For this reason Cesarean section was decided upon, and both mother and child made an uneventful recovery. I have, since then, performed a second Cesarean section upon this patient.

Two patients, in the series of cases referred to above, have had previous labors terminated by pubiotomy. In one instance I performed the operation. Pubiotomy had been resorted to in previous labors because the viability of the child was in doubt, and because of previous attempts at delivery with forceps. Both mothers were eager for living children. These two cases, and a number of others, clearly demonstrate that pubiotomy does not permanently enlarge the pelvic girdle. If it does, the enlargement is so slight as to be hardly perceptible, a point to be borne in mind when this operation is under consideration. Both of these patients were given the test of labor; but as the head did not engage even after the membranes had ruptured, then delivery by Cesarean section was decided upon.

While speaking of pubiotomy, I wish to reiterate what I said

before, that, in my opinion, pubiotomy is no competitor of Cesarean section. Pubiotomy, as far as I am concerned, is always an operation of emergency in neglected patients in whom the child is still viable, and in whom the disproportion between the fetal head and pelvic cavity is not too great. One must never perform pubiotomy when the disproportion is excessive, because the injury to the sacro-iliac joints may be so serious as to disable the patient permanently. The vaginal vault, including the bladder, may be injured beyond repair in pubiotomy. In such cases Cesarean section should be preferred, if the patient's condition permits; if not, craniotomy should be selected.

In two patients induction of labor in the thirty-sixth week of pregnancy was attempted. In one the previous child was delivered by high forceps, in the other by Cesarean section. When labor set in, it was apparent that the fetal head would not pass through. In both cases the head failed to engage notwithstanding the strong uterine contractions. Delivery was accomplished by the abdominal route.

Another class of patients, in whom induction of labor is indicated, are those in whom the fetal head is found in the pelvis early in the ninth month of pregnancy; but in whom it is discovered floating loosely above the brim when the patients are again examined near the end of gestation. In these cases the fetal head, evidently, outgrew the pelvic basin and sought freedom above. As soon as this condition is discovered, the pregnancy should be terminated.

Induction of labor, if performed under proper surroundings, will not in any way interfere with any other surgical procedure that may be decided upon later. In inducing labor, the obstetrician should place a large-sized rectal tube entirely into the uterine cavity, between its wall and the membranes, and snugly pack the cervix with gauze. Up to the present time, this method has never failed me; and I have never had to resort to the use of bags. If the first introduction of the rectal tube fails to bring on labor, I remove the tube at the end of thirty-six hours and introduce another. It is but seldom that the first tube fails to cause the desired uterine contractions, particularly when the patient is carefully observed, and then a small dose of 3 m. of pituitrin may be administered for the onset of uterine contractions.

In two cases fibroid tumors in the lower portion of the uterus prevented the head from passing through. In both cases a classical Cesarean section was done, and the fibroids were not disturbed. I believe this to be the safer plan. An hysterectomy or a myomec-

tomy, at the time of labor, adds materially to the dangers of Cesarean section, and patients should not be subjected to additional risk, or to any operative procedure which may be done at a later date. Again, after involution has taken place, a simple myomectomy will often be sufficient to relieve the patient of the tumor when, otherwise, an hysterectomy would have been necessary. Unless there are indications of sloughing of the tumor, it is best not to experiment with it.

In one case section was performed because of double uterus. This patient, a primipara, was in labor for about twelve hours. Her local condition was not quite clear to the attending physician. A vaginal examination revealed that the woman was pregnant in the right uterus, and that the cervical opening was situated high up and to the right in the vagina. The other cervix was found where the cervix normally should be. As labor progressed, the left uterus was pushed down and in front of the right cervix. The nonpregnant uterus was plainly demonstrated during the operation. Two distinct uterine cavities were easily demonstrable eight weeks postpartum.

In two patients, some form of astresia of the cervix existed. Both were primipara. One had been married nineteen years before she became pregnant, and the other fifteen years. Both had had two or more cervical operations because of their sterility. In both cases the cervical opening could hardly be discerned, notwithstanding severe labor pains that had lasted for a number of hours. In one case there was a congenital absence of the cervix. The vaginal vault and the uterus were continuous. In such patients birth of the child through the vaginal route, if at all possible, can take place only at the expense of the bladder and rectal walls. This patient was in labor for about twelve hours, and I could not find any opening leading to the uterine cavity. In one case the dystocia was due to a vaginal fixation operation. The cervix was situated high in the pelvis facing the promontory of the sacrum, preventing the head from engaging. The uterus was fixed anteriorly, and the contractions were interfered with. I felt that any mechanical procedure through the vaginal route would be dangerous for both mother and child, and therefore decided upon delivery by the abdominal route.

One patient, who had a congential heart lesion, was dangerously ill during the last three months of pregnancy. Interruption of pregnancy was rejected. When labor set in, it was thought best to deliver by Cesarean section. This patient made an uneventful recovery; but died of heart disease three years later.

The other cases did not present any unusual features. Section was performed because of some deformity of the pelvis, some disproportion between the fetal head and the pelvis, or some impaction of the presenting part.

The technic followed is that adopted by most of the operators, except that I use the continuous suture, and the stitch of the muscular coat is placed laterally instead of transversely. In this way, I believe, a better coaptation of the surfaces is obtained, and bleeding is better controlled, as no blood-vessel of any importance can escape the suture when it is placed laterally.

The postoperative treatment consists of small doses of morphine, one-twelfth to one-eighth of a grain. When necessary, ½ c.c. of pituitrin is given three times daily for three days, beginning six hours after the operation. The Fowler position is maintained for about four days.

This has been my experience with the Cesarean operation. Personal relation with the patients and the family physician compelled me to weigh carefully every indication. At times, I had to combat not only the prejudice of the patient against this operation, but also that of the attending physician, a condition that was especially true in the past.

When I look back, I feel that my judgment was not always correct, for I realize now that a few of the patients who have been subjected to Cesarean section, would have fared better if some other method of delivery had been adopted. On the other hand, I think many of the patients who were delivered *per vaginam* would have fared better had they been delivered through the abdomen. These patients not only lost their babies, but were also invalided for a long time. On the whole, I believe that the results in this series of cases are fairly good. A mortality of 7 per cent. is not large in a group of patients who were not selected, and who presented almost every obstetric complication.

Finally, I want to state that the indications, and contraindications, for Cesarean section must be carefully considered. Only one who is well trained in obstetrics has a right to sit in judgment upon the cases above reported. A general surgeon does not possess the necessary knowledge to pass upon such an important question. If Cesarean section is performed indiscriminately, a decrease in the birth-rate will inevitably result. The majority of women will not submit to this operation if it can be avoided. For this and many other reasons, therefore, Cesarean section should be left entirely to the well-trained obstetrician.

DISCUSSION.

Dr. Arthur H. Bill, Cleveland, Ohio.—I was very much interested in what Dr. Brown said with reference to walling off the peritoneal cavity in cases of Cesarean section. Four or five years ago I tried the method of using towel clamps for this purpose and attempted to make a transperitoneal section by clamping the uterus to the abdominal wall. Thin layers of gauze were placed smoothly between the uterus and abdominal wall, folded back over the skin, and an incision made in the uterus through the peritoneum and slightly into the muscle, and then the uterus clamped to the abdominal wall by six clamps. I did not feel that I had developed the technic of the procedure and do not think so to-day. The trouble with ordinary towel clamps is that they have such short jaws that it is difficult to grasp the muscle. Recently I have found clamps with long jaws, ordinary volsellum forceps with marked curves. They act well in this procedure. I think that this method offers possibilities which are well worth developing, and one can wall off the peritoneal cavity and prevent most of the contents of the uterus from getting into it.

With reference to the paper of Dr. Rongy, while I practically agree with everything he said, there is one point on which I can hardly agree, namely, his positive statement that Cesarean section is never indicated in the preëclamptic stage. I have seen cases in which the induction of labor has been performed in the preëclamptic stage and shortly after the onset of labor the woman had convulsions. This meant of course that labor had a bad effect upon that individual case. While the induction of labor in the preëclamptic stage is justifiable, we have to estimate how nearly the patient is to the border line between the preëclamptic stage and eclampsia proper.

I saw a case last week in which the patient had been under the usual treatment for preëclamptic toxemia and had improved as much as seemed possible. She had reached the height of her improvement and then became worse. Her systolic pressure was 220 and diastolic 140. She could not recognize individuals in the room because of partial blindness. She was in a condition in which it seemed that the induction of labor would have been hazardous and I delivered her by Cesarean section. About twelve hours afterward she had one convulsion; she had no more and is recovering. I feel that in this particular case the induction of labor would have been disastrous. There are cases in which the patient's condition is too serious to warrant the induction of labor in the preëclamptic stage, and we must not make the positive statement that a section is never indicated.

Just one other point with regard to the question of contamination. One of the unfortunate things in consultation work is that we are called upon to see cases in which the family physician had made repeated examinations, and we feel that the danger of infection is too great to warrant Cesarean section. We warn our medical students against vaginal examinations in cases in which there is

doubt as to the possibility of the head passing through the pelvis. We teach them that it is possible by rectal examination to determine almost as much as by a vaginal examination; that by rectal examination we can determine the degree of dilatation of the os nicely; we can often feel the sutures and determine the station of the head in the pelvis. If rectal examinations were resorted to more frequently than they are we would not find in cases which demand a Cesarean section a contraindication on account of contamination.

Dr. Edward J. Ill, Newark, New Jersey.—In connection with these two papers and the discussion that followed them, I would like again to draw attention to the method of irrigating these uteri that are septic with the alcohol drain. While I have not done any Cesarean sections for some time, having left them to the younger men, we have invariably put in an alcohol drain in all cases that were septic at the time of operation and have not had any deaths.

Let me speak again of the technic for the benefit of those who may not have heard my talk about it last year. After the uterus has been opened and fetus removed a tube is pushed down in the vagina long enough to reach beyond the vulva. A strip of 2-inch iodoform gauze is pushed down alongside the tube into the vagina; the whole uterine cavity is snugly filled with the gauze, care being taken that the end of the rubber catheter (No. 17) is near the fundus, not at the fundus. Then the uterus is sewed by such methods as one is accustomed to use. Immediately after the patient is put to bed 50 c.c. of dilute 25 per cent. alcohol is poured through this gauze. This is repeated by the nurse every two hours. There is no danger of the tube slipping out if it is fastened from below to the gauze with a piece of string.

Captain John Norval Bell, Detroit, Michigan.—Relative to Dr. Rongy's conservative treatment of eclampsia, he made the statement that he gives these cases large doses of morphin. I cannot agree with that. I think the general outline of his form of treatment is good, but I would draw the line in regard to using large doses of morphin. The treatment should be carefully guarded because you have a child that is already very toxic, and if you give a woman half a grain of morphin you are likely to have a dead child. On the other hand, if you give one-quarter or one-eighth of a grain and repeat it in an hour, the infant mortality would not be so large.

Dr. Brown (closing the discussion on his part).—I, too, have found the same difficulty with these towel clamps that Dr. Bill has found, although I have usually accomplished the purpose. The greatest difficulty I have had is in their cutting into the tissues. They have not been large enough to be able to grasp enough tissue to hold. I was able to find a towel clamp with two prongs instead of one, and in using it was enabled to get a better grasp and hold the tissues better. But they are not ideal instruments for this purpose. A flat blade like a double volsellum would certainly be vastly superior, and I have thought of developing some special clamp for the purpose.

I have been doing the operation described for five or six years

in this way. In fact, when I first started it I did not grasp the possibilities of the towel clamp, and I advocated taking time to use several interrupted sutures to sew the incisions together, but of course it was a very foolish sort of thing to do when you can do it so much better with an instrument.

Dr. Hayd.—Did you have pieces of gauze underneath your clamps?

Dr. Brown.—I did not.

Dr. Hayd.—How do you protect or guard against skin infection from entering the uterine cavity if your sharp point goes through the skin and goes through the uterus?

Dr. Brown.—It does not go through the skin into the uterus. The point of the prong is not long enough to go through the skin, muscle, uterine wall and into the endometrium. I am perfectly satisfied the outside prong does not go into the endometrium. I do not, as a rule, put the clamp into the endometrium. I make application of the clamp before I have opened the uterine cavity; I make an incision in the muscle and grasp a portion of that muscle with the skin. It does save a lot of manipulation of the contents of the abdomen.

Dr. Skeel.—I would like to ask Dr. Brown whether he makes a high incision or low incision under local anesthesia.

Dr. Brown.—I make absolutely no difference in the incision under local or general anesthesia. I use the ordinary Davis high incision, about 2 or 2½ inches long above the umbilicus. I have had no difficulty at all.

Dr. Rongy (closing).—I would like to ask Dr. Brown if any of his patients ever had a convulsion while the operation was going on?

Dr. Brown.—No.

Dr. Rongy.—If any of these patients should have a convulsion while operating, what would you do?

Dr. Brown.—I do not know. I have only once resorted to local anesthesia in operating in the eclamptic condition. That patient was in a state of impending eclampsia; a few hours later she did have several convulsions. I do not believe it would make any difference whether the operation was done under local or general anesthesia if she had a convulsion.

Dr. Rongy.—What about the abdominal contents?

Dr. Brown.—My clamping would hold the abdominal contents back very well.

Dr. Rongy.—Regarding the point raised by Dr. Bill of performing Cesarean section in the preëclamptic stage, it seems to me that one has always time to induce labor in such cases. We must not wait too long in these patients, very often they become severely toxic and have no convulsions. The degree of the toxicity must not always be judged by the convulsions. If a patient is carefully watched the obstetrician will always be able to observe the change in her condition. Every case of toxemia of pregnancy which does not improve under medical treatment should have the pregnancy interrupted. In that way the severe types of eclampsia which very often permanently damage the kidneys and heart will be eliminated.

I did not mention in my paper that in the supposedly infected cases, I, as a rule pack the lower segment of the uterus with 10 per cent. iodoform gauze, and remove it at the end of twenty-four hours. It seems to me, if there is a remnant of focal infection in the lower segment of the uterus the 10 per cent. iodoform gauze will probably kill some of the bacteria on the surface which causes the infection.

Regarding the administration of large doses of morphin, the only way to control convulsions is by giving large doses. By a large dose I do not mean the initial dose but enough morphin to control the attacks. I have given as much as 3 grains in twenty-four hours, beginning with one-quarter of a grain and repeating it at the end of an hour or two. In these cases we should not be frightened by the use of large doses even if the respiration comes down to ten or twelve times per minute.

THE QUESTION OF STERILIZING WOMEN WHEN OPERATING FOR TUBERCULAR PERITONITIS.

BY

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In operating for tubercular peritonitis, many surgeons remove the tubes and ovaries, or at least the tubes; and their reason for so doing is one that I absolutely cannot understand. Thousands upon thousands of tubercular nodules are left in the peritoneum, studding the bowels, liver, and stomach; but in 90 per cent. of all cases these nodules are absorbed, and eventually disappear. Since no cause is present to prevent those on the tubes from being absorbed in the same manner, the removal of the tubes in the operation for peritonitis impresses me as both unjustifiable and absurd.

This procedure will no doubt be defended on the ground that the appendix is removed in the operation for tubercular appendicitis. Under such a condition, however, an appendectomy is necessary, for the tubercular deposit on the peritoneal covering of the organ will cause distortion, kinking, and sometimes adhesions. The result is the obstruction of the lumen, which is often the cause of appendicular trouble. Though acute inflammation of the appendix often brings about general peritonitis and subsequent death, the effects are not the same in the case of the Fallopian tubes.

The necessity of sterilization can readily be understood in the event of tubal disease, mixed infection, or streptococcus; or in any case showing closure of the tubes, occasional leakage, or repeated attacks of pelvic peritonitis; but conditions of this variety are separate and distinct from ordinary tubercular peritonitis. Some physicians claim that tubercles make their way through the tube in a continuous stream until the tube is closed and the progress of the stream is arrested. It may be possible that at times the tubercles do enter the peritoneum by means of the tube, though instances of such a nature have, in my experience, been rare. Cases of tuberculosis of the vagina or of the membranous lining of the uterus are so infrequent that the occurrence of tubercular peritonitis re-

sulting from the entrance of bacilli into the peritoneum through the vagina, uterus, or Fallopian tubes has not been definitely established.

How, then, do the tubercles reach the appendix, since the end of this organ is closed? They are carried in through the lymph channels and the blood current; and if nature kindly causes absorption of the thousands of tubercles in the peritoneum after it has been opened and cleansed, then nature will care also for the few tubercles remaining on the tubes of the ovaries. In several cases I have found it possible to demonstrate the truth of this statement, and consequently for many years I have removed no tube or ovary showing a tubercular deposit with the exception of old pus-tubes that obviously necessitated excision.

The diagnosis of tubercular peritonitis is at all times a difficult matter. Occasionally, when the symptoms lead us to suspect its existence, we find no tubercular peritonitis whatever; and at other times it is unexpectedly revealed when we are operating for abnormal states such as adhesions, retroversion of the uterus, or sterility. During the past year I have performed two operations for retroversion, both for the purpose of improving the sterile condition. One of the patients is now four months' pregnant, and there is certainly no happier woman than she. Since the original draft of this paper was written, a second case of pregnancy has come under my observation; and one can readily understand how both were made possible by a procedure which did not close the tubes, and thus did not prevent the constant outpouring of tubercles from the end into the peritoneal cavity.

The operative technic employed in cases of tubercular peritonitis is not, I believe, highly important. During my early days I washed the peritoneal cavity with bichloride solution, one to ten thousand, introducing nearly a quart of the fluid, and trying to cleanse every part of the cavity. This procedure was effective in irritating or stimulating the peritoneum. After the solution was removed, in order to prevent any possibility of mercury poisoning, I again washed the peritoneal cavity twice with a normal saline solution. When the peritoneum was dry, it was sewed with catgut, and the muscles and fascia were fastened in layers. To close the skin, I used only *sterile adhesive plaster*, and, as a rule, the wound healed promptly.

In the beginning, silkworm sutures, though occasionally used, proved unsatisfactory because they acted as a drain. Along the tract of each suture a deposit of tubercles made its appearance, and

each stitch hole showed a dark red spot of the variety seen in healing tubercular sinuses. These generally persisted for a long time. Drainage, of course, is not to be considered because the wound does not drain, and the patient may develop ulceration and fistula.

My conclusion, then, is simply this: if nature, by constitutional means, proper treatment, tuberculin, and every remedy available in developing anti-bodies, can cure tuberculosis, whether it be in the lungs, joints, or peritoneum, then nature will also cure tubercles in the peritoneum; she will not merely remove a few of them.

In closing, therefore, I may summarize:

1. The thousands of tubercles in the peritoneum are, as a rule, absorbed after celiotomy.

2. It is useless to remove the tubes if they are affected to tubercles only.

3. Many patients who undergo operations for tubercular peritonitis are young and unmarried, and should not be needlessly sterilized.

DISCUSSION.

Dr. Herman E. Hayd, Buffalo, New York.—I do not think we are justified in sterilizing every young woman who has tubercular peritonitis. All of us have operated on many cases doing only a laparotomy. We did not remove the tubes yet we have seen these young women get symptomatically well; they have put on from 20 to 30 pounds of flesh, and have lived long and useful lives.

Dr. William Mayo wrote an interesting paper which was published in a July number of the Journal of the American Medical Association, in which he took up the treatment of tubercular peritonitis. He advised removing the tubes in all cases. Now, if we can prove that women do conceive and bear children who had tubercular peritonitis, then we should not take out all tubes. If, however, women do not conceive after they have had tubercular peritonitis, and if it be possible, that the tubes are usually the atrium through which the tubercle bacillus gets into the peritoneal cavity, then we should remove the tubes; but we know, that the tubercle also travels through the lymph currents, and through the blood, as has been pointed out. The important thing for us to make up our minds about is: how many of the women we have operated on have borne children? We know we have operated on young girls who have subsequently married but did they bear children? That is the crux of the proposition. If they cannot conceive because the cilia of the tube is destroyed by the tubercle bacillus, then there is no necessity of having the tubes. If they can conceive, then they should keep their tubes. Dr. Eisendrath, of Chicago, in a discussion on the paper of Dr. Mayo, reported the case of a girl, fifteen

years of age, on whom he operated for a genuine tubercular peritonitis, and subsequently he reported her as having borne two children.

Mayo reports in his paper a number of cases he operated on of the acitic types, from three to seven times and did not cure them, until he took out the tubes, when they got well at once. The pathology is the same, whether the exudate is serous or plastic, the same organism produces in one peritoneum a serous fluid, and in the other peritoneum it produces a plastic exudate, where bowels stick together and the tissues generally unite.

This is a very important subject. I called the attention of Dr. Mann, of Buffalo, to the article by Mayo and asked him, if he had in his experience, any woman who had borne children upon whom he had operated previously for tubercular peritonitis, and he said he could not recall one. I looked over my own cases and I find I have none. This is a subject we should give some thought to during the coming year and then it will be profitable for us to discuss the matter at a later time with reports of pregnancy following operation without removal of tubes.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—Dr. Carstens infers that we do not get tubercular infection from the uterus into the tubes. In the first place, I would like to ask why it is that tubercular peritonitis is infinitely more common in women than it is in men, and the great majority of cases of tubercular peritonitis first originate in the tubes. We know that the gonococcus, for instance, goes through the vagina and invades the cervix, or it goes into the urethra. It finds a certain ground that it likes to grow on, and we can readily infer that the bacillus of tuberculosis looks out for a soil on which it grows best. For one I believe that many times, not always, the bacillus of tuberculosis does get into the peritoneal cavity through the tubes. I want the President to call on Dr. John Miller to report a case which he recently had which bears on the point Dr. Hayd brings up.

The next thing I want to call attention to is the suggestion made by Dr. W. E. Savage. He saw me operate on a number of cases of tubercular peritonitis and saw them get well. When he asked why it was they recovered, I, like the rest of you, could not explain it. The first case of tubercular peritonitis he operated on he found the adhesions so tremendously bad that he did not do anything, but sewed up the incision in the abdominal wall, and the patient got well just the same as my patients got well. It could not have been sunlight or the traumatism. What could it be?

He came to the conclusion it was nothing but the anesthesia, and therefore, he has since that time treated and reported the cure of quite a series of cases of tubercular peritonitis by the administration of ether for thirty, forty or fifty minutes. The first time he gave the patients ether as long as he thought they could bear it, and in a few weeks he gave it to them a still longer time. He has reported excellent results from that, and he is a careful and conservative observer. He has shown that great improvement takes place

in cases of tuberculosis of the lungs from the inhalation of ether. In his experience in those cases where there is not too much mixed infection the improvement is very marked. In cases of mixed infection he finds temporary improvement; after ether is administered the patients temperature will drop, and a patient who has not been able to eat for a week will be hungry. I have seen some of his cases in the hospital develop a ravenous appetite within forty-eight hours, eating three meals a day. I knew one of his patients, who was a street car conductor, and when he entered the hospital he was emaciated and had no appetite, and some months afterward I saw him taking fares on the street car. He received no treatment except the inhalation of ether by the closed cone method.

Now, I believe there is a great deal in this, and yet I am not thoroughly convinced that is the whole thing. I still believe, as I started out to say, that the majority of cases of tubercular peritonitis in women start in the tubes, and that most of the infection is there when I operate on them. If the tubes are badly diseased; if they are the foci of infection, I will remove them, because in doing so I believe I will weaken the army of invasion and thus helping nature to make her fight. After all, that is probably what ether does.

One of the most distinguished users of the *x*-ray in this country tells me that the good the *x*-ray does in malignant disease is, not that is has any effect at all upon the malignant germ or malignant cells, or anything of that sort, but that it simply increases the local resistance to the invasion of these germs, and if the ether does anything at all, it stimulates the fighting powers of the general system.

Dr. Thomas B. Noble, Indianapolis, Indiana.—There are a great many points in connection with this subject and discussion concerning which we are rather in the dark. There has been nothing said relative to the pathology that underlies the therapy here advocated. Dr. Carstens spoke of tubercles being on the ovaries and on the tubes, and that a laparotomy would relieve these tubercles in many cases; but in my own experience it will not relieve the individual from the tubercles and the tubercle bacilli that exist in the endometrium of the tubes and in the endometrium of the uterus itself.

I have had the experience of doing a laparotomy where ascites was present and tubercles studding everything in view, where the tubes were buried and fusion of the pelvic organs was so great that dissection at that time was impossible. I have seen recovery occur temporarily and recurrence take place four or five years afterward, when a subsequent laparotomy, with the removal of the tubercular tubes with tuberculosis of the endometrium and tuberculosis of the uterus, was followed by a cure.

I am very much interested in what Dr. Bonifield has said relative to the influence of ether on the disappearance of tubercles, but that does not and cannot account for the disappearance of tuberculosis in the peritoneal cavity, the peritoneal cavity having been opened under a local anesthetic, and it has been our practice in many instances to open the abdomen under local anesthesia widely and

have a symptomatic cure follow, so that there must be something outside of ether itself that bears a causative relationship to a cure.

Major Robert T. Morris, New York City.—Ether in tuberculosis is the same thing as whiskey in tuberculosis; it is simply a question of which you would rather take. The principle is this: Anything which increases resistance, and particularly hyperleukocytosis, may cure tuberculosis symptomatically When we open the abdomen, with the introduction of bichlorid of mercury, or when we open it with the introduction of peroxid of hydrogen, if we open it with alacrity or slowly and expose the peritoneum, in fifteen minutes we have a hyperleukocytosis, and that is what kills the tubercle bacillus. You can do the same thing in the ankle with the Bier method of treatment. You can do the same thing in the knee-joint with Bier hyperemia. Get up your hyperemia, increase the hyperleukocytosis, and down goes the tubercle bacillus. The tubercle bacillus cannot stand it.

As regards the Fallopian tube, if the tube has been destroyed, has lost its integrity as a tube, take it out; but if it is simply studded with tubercle bacilli, leave it in, provided that is a part of the picture, and not the focus. The idea is, if you have distinctly a focus at the tube which destroys the tube, take the tube out. The same thing refers to the appendix. If you have distinctly a focus in which destruction of tissue has taken place in the appendix, take it out, otherwise leave it, and depend upon hyperleukocytosis, no matter how you bring it about. You bring about a symptomatic cure in most cases of tuberculosis of the peritoneum as a result simply of getting up a local hyperleukocytosis. Whichever way is cheapest for the patient and pleasantest for the patient is the desirable way. Having made that extremely important first move, a point which is almost always left out is following the case up and disposing of the susceptibility of the patient to tuberculosis. I believe you should give the patient tuberculin for a year or more (Koch's old tuberculin is the best), at the end of which time you may not get as good results as you anticipated, but next year it may have cured the patient.

Another point: Give these patients the same sort of treatment that you would give them for tuberculosis of any sort; give them plenty of milk, send them up in the mountains for sunshine.

Dr. G. Van Amber Brown, Detroit, Michigan.—I think there is one point that has not been mentioned either in the paper or in the discussion, it is this, to differentiate between tubercular peritonitis and peritoneal tuberculosis. With a tubercular peritonitis we have had an ascitic exudate; it is of high specific gravity. It is in this type of case we get a deformed tube that is useless, and when its function has been destroyed because of its anatomical distortion, it should be removed. On the other hand, we have in peritoneal tuberculosis a transudate (its specific gravity is below 1028). These are the cases in which it may not be necessary to remove the tubes. Simply opening the abdomen cures them. They constitute the type of cases referred to by Dr. Morris.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—I have a hospital service of about 300 beds for tuberculous patients. I have been running it for about ten years, and during that time we have tried everything you could think of. We have tried ether and we find it does not do a bit of good.

This *post hoc ergo propter hoc* reminds one of the emetin business for cancer. It works bully while you are doing it. Hamburgher of Vienna made a large number of observations to discover how the tuberculous germ got into the system, infected it, and subsequently how we became tuberculous. There was a sharp distinction made between infection and tuberculosis itself. I am speaking of the human germ that goes into the lung. The tubercle bacillus gets into the hilum and glands and stays there until it is dislodged. If you do things that are unsanitary it may remain there from childhood and get back into the system and produce the disease. True tuberculosis is a disease of childhood. No one ever gets it after fourteen. It is almost impossible for an individual to get tuberculosis after fourteen. You may go back to the time of Laennec, over one hundred years, and every man who has studied tuberculosis will tell you the same thing. The public does not know it, and a good many doctors do not know it. We have in the peritoneal cavity a tuberculous condition which is different from anywhere else in the body. Some one said, and I presume you cannot, close a wound in an operation for the removal of a tuberculous focus without getting a fistula. I think Dr. Erdmann made that remark. We have found that out, but you can go into a tuberculous abdomen and close it up and never get a fistula. Study the work of the internists as well as the work of the surgeons, and you will find that 50 per cent. recoveries come to them as well as to the surgeons, and these recoveries may extend over a period of five years or longer the same as we have recoveries from cancer for that period of time. But that is not the reason why patients recover. It may be due to the fact that while you have the abdomen open, according to some recent researches, carbonic acid is exhaled more rapidly from the surface of the intestine than it is exhaled from the lung, and you have a carbonization of that surface. It may be due to the fact that the colon bacilli are always passing from the intestinal tract to the peritoneal surface and are being picked up by the omentum.

Dr. Bonifield.—I would like to ask Dr. Dickinson how he administers ether.

Dr. Dickinson.—By the ordinary methods in vogue. We have operated on a good many cases. We give ether by the drop method and sometimes by the Bennet inhaler.

Dr. Hayd.—In case you do not operate, have you ever used ether in a case of consumption?

Dr. Dickinson.—No.

Dr. Bonifield.—How do you give it?

Dr. Dickinson.—In an operative case I give enough for the specific effect. Ether is the strongest antiseptic we have. I pointed that out in a paper I read in New York two years ago on "The

Dangers of Anesthesia." From the little work in surgery I have done on tuberculous cases, I have seen very little relief from ether.

Dr. Bonifield.—You have not answered my question. In your discussion you stated that one of the ways in which tuberculosis is recovered from is by the escape of carbonic acid gas from the bowel. I stated that when I spoke of the effects of ether given by Dr. Savage by the closed cone method in which there is reaccumulated a large quantity of carbonic acid gas, and if ether is not given in that way in my judgment it does not have such a beneficial effect on these cases.

Dr. James E. Davis, Detroit, Michigan.—I think Dr. Carstens' position from the standpoint of the pathologist is correct. When you study a section of the tube where tuberculosis is present, it is always found upon the peritoneal surface. Very few tubercles are found deeper in from the peritoneal surface. It is seldom that we find lymph follicles excepting very small ones. It is quite different in the appendix V. In the appendix V there is a definite layer, if we may so term it, made up of lymph follicles, first the glandularis and then the lymph follicle. In the case of tuberculosis of the appendix, the tubercles usually are found in the submucosa of the gut. Ordinarily, they are found there first. This harmonizes very well with what has been said by one of the other speakers, that tuberculosis has a selective action upon the gland tissue, the lymph tissue, and in the entire intestinal tract there is a rich lymph follicle distribution.

Major Carstens (closing).—I knew that my views would meet with some opposition. I have merely given you my experience based on careful observation of these cases.

One of the speakers said that tubercle bacilli get into the tube from the vagina and the uterus, and that the gonococcus gets up there. Of course, the gonococcus can get up there. How do you know that gonococci get up there? You see them. I want to ask every one of you this question, did you ever see tubercle bacilli in the vagina or in the uterus, any of you? They are not there. In all those cases I operated on and curetted I had the curetings examined, as I have had the curetted material examined of every case I have curetted, and none of them who had tubercle bacilli in the peritoneum, had any in the mucous membrane of the vagina or of the uterus or of the cervix. I only found tubercle bacilli in one case, and that was an old woman, fifty-six years of age who, after a menopause years ago, who was taken with a severe hemorrhage. I thought she had senile endometritis or cancer and the uterus was so large that I became suspicious. I took out the uterus, and lo and behold there was a case of hemorrhage from a tubercular uterus, the only one I ever saw in my life. Someone said that if the tubes are not any good and the woman does not become pregnant anyway, there was no use to leave them in; that it was better to take them out. A woman who has tubes in her still has "that hope that springs eternal in the human breast." If you take the tubes out, that hope is gone forever. I do not want to remove hope from anybody. Whether that is the original focus, or whether the mass of

tubercle bacilli is in the omentum, and you have seen it as large as my fists or two fists, so that you think you are dealing with fibroid tumors or secondary deposits from the tubes, it does not make any difference; those are multiplying and producing new secondary deposits from that large mass in the omentum, and yet in three months they are all gone. They have disappeared from the omentum. They will disappear from everywhere else just the same as they will disappear from the tubes, and so I say, let the tubes alone unless they are infected by some mixed infection and are absolutely destroyed. Give the woman a chance.

RECOGNITION AND MANAGEMENT OF LABOR INJURIES.

BY

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During the last decade there has been a gradually growing recognition of the fact that obstetrics is a surgical specialty. In accord with this rather reluctant and surely very tardy acknowledgment, obstetric leaders have been actively voicing the need for more careful obstetric training and more rigid technic.

The results of this effort are only beginning to be felt, and at times it has seemed that the mass of the profession is indifferent to obstetric advances. Lack of training on the part of the older practitioners undoubtedly accounts for some of this rather discouraging inertia, but the writer believes that lack of opportunity to carry out modern procedures is responsible for a great deal of the indifference to correct obstetric technic.

Modern surgery would surely be impossible without the hospital. Modern technic in obstetrics is equally impossible in the average home. We must have vastly increased hospital facilities and give the doctor access to them if we expect to increase his interest in that technic which only the hospital renders possible.

At the present time, when so many doctors are called away, and so few are left to take care of the community, hospitalization is still more necessary. Bringing the patient to the doctor, economizes his time, increases his efficiency, and permits the patient to receive more attention. All of the author's work is done at the hospital; therefore, the data and conclusions can only apply to such surroundings as make complete work possible.

It is not necessary before this Association to emphasize the fact that the end results of pregnancy and labor are still unsatisfactory. Most of you spend a large portion of your time attempting to correct these conditions.

Many labor injuries remain uncorrected at the time of delivery, because they are not discovered at that time. In fact, our whole

obstetric teaching, based on the fear of infection, is such as to discourage careful investigation of the genital tract immediately after labor. The student is taught the utmost precision of detail in making examinations during labor, and is solemnly assured that *after* the delivery of the child, this tract is so liable to infection that it must not be invaded except for most urgent cause. This "*noli me tangere*" idea of the genital tract after the termination of the second stage of labor has been so emphasized that many conscientious men fear to conduct a detailed examination for birth damage.

While recognizing the danger of lax methods in this respect, the writer feels that proper technic renders this procedure safe, and that in most cases it is highly desirable. In the past, when repeated vaginal examinations were made during labor, no doubt the vagina was more or less contaminated, and post-delivery examinations served to carrry this contamination higher up the genital tract. Rectal examination during labor does away completely with this particular danger.

Most labors can be conducted safely with the knowledge gained by abdominal examination, supplemented by the gloved rectal touch. Presentation, degree of cervical dilatation, and station of the presenting part can usually be determined accurately per rectum.

If the labor has been thus conducted, the vagina should be *relatively* free from pathogenic bacteria at the end of a labor of reasonable duration. This, of course, does not hold true when the amniotic sac has been ruptured for a long time, or when other unusual opportunities for infection are present.

In operative deliveries, of course, the chance for contamination is greater, but the need for careful examination for injuries is also greater. After some experience with complete after-delivery examinations, one becomes quite skilful in predicting whether serious injury has occurred in the higher parts of the genital canal.

Considerable study was given to the technic of this examination. At present we are proceeding as follows:

In the first place, keeping vaginal manipulations to an irreducible minimum is considered part of the technic of safe postpartum investigation. After delivery of the placenta, the patient is put in the lithotomy position, the labia carefully cleansed, and gas analgesia is resumed. The anus is covered with either dental rubber dam or sterile towels held in position by adhesive plaster fastened to the thighs. Fresh gloves are put on and the examination is begun by inspection of the cervix. Either a drop light or a good head light is essential to a satisfactory inspection. After the patient

is cleansed, retractors are introduced. The author uses a special retractor made wider in proportion to its length than the standard shape. An assistant makes pressure on the fundus, bringing the anterior lip of the cervix to the vulva. For grasping the cervix, volsella are unsatisfactory, therefore cervix holders of the old sponge holder type are used. The rim of the cervix is readily inspected by bringing successive portions into view, using two holders in hand over hand fashion for bringing down the concealed posterior lip. Sometimes before delivery of the placenta one may inspect the entire cervix at a glance, the whole cervical rim fitting about the placenta as it does over a distended Voorhees bag.

One sometimes finds the cervix absolutely intact, without even the traditional nick. Often only minor lacerations are found. These are always ignored. Usually, as gynecologists well know, the laceration will be found at the extreme right or left side of the cervical rim, sometimes extending into the base of the broad ligaments. Tears of this depth invariably involve the vaginal vault, usually extending up and down the right or left anterior sulcus.

Occasionally these deep tears bleed, but more frequently not. The old rule to inspect the cervix only if bleeding occurs, certainly does not detect the majority of extensive lacerations. Sometimes there will be found a transverse tear or cut of the anterior lip parallel to the rim of the cervix, due to pinching of this part between the head and the pubis. The part is usually black or extremely swollen, demonstrating the effect of time in producing the lesion.

Inspection of the inner surface of the cervix sometimes reveals lacerations of the uterine mucosa, and even into the muscular wall, apparently produced by the rubbing action of the head as it moved downward, distinctly different from the tears due to distention of the cervical rim, the latter being always radial in direction.

Injuries of the upper end of the vagina are of two types: *First*, those due to extension of deep cervical lacerations involving the broad ligament base and extending a variable distance downward from the cervicovaginal junction. They do not, so far as my observation goes, ever involve the posterior vaginal wall, but extend onto the lateral wall, and frequently to the anterior vaginal surface, sometimes terminating beneath the pubic arch. These would never be detected by the usual method of inspection by separating the labia and looking at the perineum. They are readily recognized as old friends of the gynecologist, who not only discovers their scars in the vaginal vault but frequently finds dense adhesions uniting the upper cervix to the vaginal wall, the torn parts having lain in close approxi-

mation after labor. These are very difficult to repair, but with patience under anesthesia, fairly satisfactory results can often be attained and, especially, much of the dense scar tissue formation can be prevented.

The *second* type of injury, involving the upper vagina, is produced by extension upward from the middle or lower portion. This type is a clean split, obliquely longitudinal in direction and is usually produced by the rotation of the head from a posterior to the anterior position. It may occur with spontaneous rotation, but is usually, in my experience, produced by the performance of the classical Scanzoni operation. I am not referring to lacerations produced by the tips or edges of the forceps blade where they have been improperly applied or where the handles of the forceps have not been rotated in a wide enough circle, but to a type which from their direction and appearance seem to be produced by the head itself when rotated from a tight fitting posterior occiput position. The mucosa and levator fibers are split, and the ischiorectal fat may be seen glistening through. The tear often involves only the mid-portion of the lateral vaginal wall. It is readily repaired and in my experience usually makes a nice recovery.

For proper inspection and repair of the mid and upper vaginal injuries, pressure by the assistant on the fundus is removed, cervix holders taken off, and firm gauze pressure applied to the cervix, pushing the entire uterus upward, thus smoothing out and distending the relaxed vaginal vault. Two vaginal retractors aid materially in securing good exposure.

In repairing the cervix No. 2 chromic interrupted sutures are used. The fear sometimes expressed of interfering with fundal drainage by too much closure of the cervical canal is not well-founded. The extreme lower rim of the cervix is often paper thin, and would not unite if sutured. We, therefore, place the last suture about $\frac{1}{3}$ to $\frac{1}{2}$ inch from the edge. The uppermost sutures of deep cervical and vaginal tears can often be best made by placing the lower one first and using these as tractors to secure good exposure of the higher portions.

Tears in the subpubic region are almost as common as perineal tears. They are usually very evidently produced by the practice of lifting the head toward the pubes in the attempt to avoid perineal injuries. During distention of the vulvar ring the lower edge of the pubic portion of the triangular ligaments and fascia are distinctly seen, fully as tense as is the perineal edge. If one must choose between perineal laceration and subpubic injury, let it be the peri-

neum which suffers, because the success of primary repair is much more certain.

So much has been said and written about perineal repair, primary, intermediate, and late, that I hesitate to express an opinion. However, recent statements as to the impossibility of securing good results with primary perineal repair from sources of considerable authority, leads me to record my own experience.

The usual procedure for primary repair of the perineum is simply a crude device for avoiding the buried suture. The wide sweeping suture, with a large curved needle so commonly pictured as sewing the retracted muscle ends, usually failed in my hands of securing the desired result.

When I learned not to fear a buried suture in the perineum after labor, any more than in a late repair, my difficulties in getting good results began to disappear.

The perineum is inspected and palpated, enlarging muscosa rents as necessary to follow up muscular and fascia tears. Not infrequently the vaginal mucosa is separated almost as in the secondary operation. No. 2 chromic gut is used on a small curved needle and buried without hesitation. The mucosa is then trimmed up and united with No. 1 gut. The results from this plan have given me a great deal of satisfaction.

With more successful repair work has come a corresponding improvement in uterine position and involution. Anyone who routinely examines his patients a few weeks after delivery detects a surprising number of cases of subinvolution and of retroversion. These are a source of considerable discomfort to the patient and other pathology follows in their wake. Many of the retroversions have preceded the pregnancy and operative restoration is the only method of cure.

Among those produced by a particular pregnancy and labor, will be found many dependent upon subinvolution due to cervical lacerations with the low grade infection so commonly present. The over-heavy, boggy fundus of the uterus drops into the sacral hollow, the cervix points anteriorly and the vicious circle has begun.

It has been gratifying to note the reduction in frequency of these cases, since adopting primary cervical repair as a routine procedure. With uterine involution proceeding normally, and the uterus remaining anterior, the circulation of the supporting ligaments remains normal, their involution and recovery of elasticity and tone occur promptly, thus insuring their future function.

As a further means of prevention of retrodeviation, we encourage

the patient early to lie on the abdomen, and on the tenth or twelfth day begin the knee-chest posture. The usual remedies, such as prolonged hot douches, ergot, etc., are used freely after 14 days, if needed.

Speaking broadly, in my last 350 cases, the cervix and upper vagina have been examined, using the technic described in about 180. In multipara, with known old lacerations, etc., we consider cervical inspection and repair not necessary. We also avoided intra-genital manipulation in cases where there was good reason to suspect infection was already present.

In this series 51 cervices needed repair; of these in nine instances for various reasons, such as preceding severe hemorrhage, known infection, etc., suturing was not done. Of the fourty-three cervical cases repaired at delivery, seven were unsuccessful—about 16 per cent.

There was one infection in the entire series of 180 inspected cases. This patient had been subjected to prolonged intrauterine manipulation, both manual and instrumental.

The use of gas has done much to make possible more careful work. The resumption of gas analgesia, or of anesthesis if needed, involves very little discomfort to the patient, and renders the whole procedure simple. The author wishes to emphasize four points, viz.:

1. Limiting or entirely avoiding vaginal examinations during labor is a routine preliminary part of the technic of primary repair of labor injuries.

2. Immediate inspection of the cervix, with primary repair of its injuries, reduces the risk of subinvolution and of uterine displacement.

3. The routine use of buried sutures in the perineum for the repair of second degree lacerations, permits accurate coaptation, and restoration of the parts.

4. Perineal lacerations are more surely repaired than is subpubic damage. Therefore, slow delivery and skill in directing the small diameters of the head through the vulvar ring should be sought. Forcing the head against the pubic arch produces more damage than it prevents.

DISCUSSION.

Dr. H. Wellington Yates, Detroit, Michigan.—Tabulated in the form in which the paper presented, with 189 cases treated so thoroughly after labor, with only one that has been infected, is certainly a credit to Dr. Skeel or any one else, inasmuch as in normal

cases we usually have infection in more than that percentage. The doctor's paper was presented on the assumption, I take it, that the majority of these cases were in the hospital, and I think that being the first item of his paper, it also makes it the strongest one in the manner of carrying on an obstetric case. We should not with primiparæ take any more chances than possible, and I think it is unfortunate for us to accept cases, where it is not permitted us to get them into the hospital.

The postoperative examination of these patients as given us by the essayist is ideal and splendid, carried out in the manner indicated, and presented to the type of men here assembled. On the other hand, this would be an exceedingly dangerous doctrine to go into the hands of the general practitioner to be applied wherever it might be applied outside of a hospital as well as in.

Dr. Morris has told us that the lochia is a normal antiseptic, and it is true when it is left alone, but when we handle the parts that are adjacent to an infected area, after manipulation and instrumentation, the lochia ceases to be that natural protective pabulum. Where labor has gone on in the usual way, instead of by a precipitous way, where the cervix has been dilated by the normal mechanical way of a soft water bag, we need not expect under ordinary circumstances that the uterus is going to be so injured that it needs investigation as the doctor's paper would indicate. But in such instances as we do have a precipitous labor, whether it be in primiparæ or multiparæ, I think the examination outlined by the essayist is a very excellent thing. In hospital work it is possible and practicable, and I think his paper is very timely and his argument well founded.

Dr. Francis Reder, St. Louis, Missouri.—Dr. Skeel's paper gives us a good stimulus for the lethargic state that many of us have gotten into relative to trauma of the parturient canal. We have usually excused ourselves from looking closely into these conditions because we feel that when the lochia sets in infection will usually destroy the repair which has been made. Furthermore, the edematous condition of the parts is such as to usually discourage any extensive repair work. However, there is necessity for a close inspection of the parturient canal after delivery. Very frequently we find injuries involving the cervix, the fornices or vaginal walls that demand immediate attention. It is true, such injuries heal, and they heal kindly because these tissues have been coffer-dammed by Nature and are not very prone to infection. However, when cicatrization takes place we have our sequelæ. These sequelæ may prove to be impediments to conception, or they may render labor more difficult, if conception takes place.

There is sometimes considerable trouble in the proper exposure of these parts. The ordinary vaginal specula we have at our command will not always answer the purpose. I have found the retractors of Dr. Deaver of Philadelphia, using four of them, two above and two below, admirable instruments for a thorough exposure of the whole vaginal tract. When it becomes necessary to repair a lacerated perineum, the cervix too should be inspected.

Only recently, in a very simple trachelorrhaphy, a patient of mine came very near perishing from a secondary hemorrhage on the ninth day, because a catgut ligature had become prematurely absorbed. Furthermore, the lacerations of which the doctor has spoken can be coapted and sutured without difficulty. All liability of a cicatrization that may cause trouble at a subsequent labor, is thereby removed.

Major Robert T. Morris, New York City.—Two principles that have not been brought forward in our discussion are important. If you have a leg bruised in the vicinity of the ankle- or knee-joint to the same degree as the perineum is bruised, you are likely to take the leg off. You are dealing with one of Nature's protected areas in a perineum operation. We can do almost any operation about the mouth and get primary union even if we do not use asepsis. We can do all sorts of work about the anus, vagina and mouth and get primary union because these are protected areas. That is one point.

Point number two. The lochial fluid is Nature's antiseptic so long as it flows freely; it is difficult to get up infection in its presence. It bathes the parts freely, but take it away and you are subjecting the patient to danger. An Indian woman in a cold, wet climate, among the worst surroundings, where she uses sphagnum moss for catching discharges, does not often have infection. In the dirtiest hovels, where the midwife superintends, you have the worst conditions. The fact that hundreds of thousands of women go through that danger where they do not have any protection except that of the freely flowing lochia loaded with nucleins, shows that they are protected by Nature's antiseptic.

Dr. Bertha Van Hoosen, Chicago (by invitation).—I am very much interested not simply in the repair of the perineum, but in the restoration of the perineum. If the perineum is torn and you have applied sutures according to any accepted method, you will find that the rectum has been displaced backward toward the coccyx. In a nulliparous woman the rectum is equidistant between the tip of the coccyx and the lower border of the symphysis. As soon as the perineum is torn the rectum recedes backward, so that it is one-fifth or two-fifths nearer the coccyx and four-fifths distant from the lower border of the symphysis. This is what we may expect because the muscles of the perineum are woven in and inexplicably matted into the fibers of the levator ani, especially the pubococcygeic fibers. That is the term used in comparative anatomy. Very few of us would expect to repair a muscle that was fastened at both ends; and yet with one end fastened to the symphysis and the other end fastened to the coccyx and the muscle on tension, we expect to get good repair. To relieve the muscle tension, I have been in the habit during the past two years of doing a coccygeal tenotomy, or slipping a knife at the tip of the coccyx through the skin and turning it a little to one side, cutting away the muscles attached to the tip of the coccyx. By putting in one or two sutures with your tension off you can get a restoration of the perineum; you get the rectum midway between the lower border of the symphysis and coccyx again, and not only that, you prevent the patient from having that

terrible constipation which most of them have during the puerperium, which, I think, is in many cases sometimes due to displacement of the rectum.

I found this gave such a wonderful restoration of the perineum as compared with ordinary repair, that I tried a series of experiments. I tried coccygeal tenotomy on a series of patients and put in no perineal stitches, taking great care to guard against infection. To my surprise, some of the ugliest, most ill-shapen tears healed perfectly. Then I tried another series of experiments in which I left the patients without repair until the fourth or fifth day, but did no coccygeal tenotomy. In all these latter cases I found they had not healed as did those that had coccygeal tenotomy, and they had to have stitches put in later. There is one thing we must recognize and, namely, we will get poor union in any set of muscles if we are going to repair them under tension.

Dr. A. J. Skeel (closing).—I have merely a word or two to say regarding the question of edema of the cervix which has been mentioned. If one examines the cervix after labor, he will find that it is the anterior lip of the cervix which is edematous, due to the pressure of the cervix by the head of the baby. The posterior lip is thin and the point seems to be to suture the junction of the posterior and anterior lips, for there is relatively little swelling and edema there. We have been taught to fear our own technic in obstetrics, and at the time this was instituted it may have been justifiable, but it is no longer so. We ought to be able under hospital surroundings, with proper technic, to trust our technic sufficiently to allow us to go into the genital canal and do whatever is necessary.

THE VERTIGO OF THE MENOPAUSE.

BY

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EQUILIBRATION in general is supposed to depend on harmonious coöperation of the sense of vision, muscle sense and balance (static-kinetic) sense. The balance sense, the most important, has as its organ the static-kinetic labyrinth (the vestibule and the three semi-circular canals of the internal ear) and as its end-organs the labyrinthine air-cells which receive stimuli from the endolymph waves brought about by bodily movements. These impulses are conducted by means of the nerve-filaments originating from these labyrinthine cells to the vestibular portion of the auditory nerve and thence through the brain-stem, cerebellar peduncles to the cerebral cortex. The recognition of the internal ear as the chief equilibratory organ being recent, most of its intracranial pathways are still undetermined.

Through this vestibular mechanism the cerebrum is continuously informed of the position of the body in space and its relation to objects around it. If, for some reason, this mechanism becomes so disturbed in any of its parts that the sense of vision and muscular sense cannot sufficiently compensate, vertigo, a subjective sensation of abnormal relationship of the body to surrounding objects, follows.

What causes the disturbance of the vestibular mechanism? There are many: organic lesions in any part of the vestibular apparatus, general toxemias, cardiovascular, renal, or ocular disturbances, etc.

In this paper we are interested in the vertigo caused by the menopause. How the vertigo of the menopause is brought about, cannot be definitely explained. It is usually ascribed to vasomotor derangement, which by causing irregularities in the circulation of the different parts of the vestibular apparatus, disturbs the balance sense.

This vasomotor derangement is supposed to be due to the loss of ovarian secretion during the menopause. In just what way this loss of ovarian secretion brings about the vasomotor disturbances is

not known. An explanation may be found in the lowered metabolism during menopause. It is claimed that ovarian substance enhances metabolism (Newman and Vas); that it increases the excretion of urea; that it favors the oxidation of hydrocarbons, fats, and phosphorized organic substances (Custallo and Tarulli), and that the removal of both ovaries is followed by a reduction in the oxygen intake of about 10 per cent. (Loewy and Richter). It is possible, then, that the lowered metabolism induced by the cessation of the ovarian internal secretion brings about a general intoxication with the consequent vasomotor disturbances. But it is possible that these vasomotor disturbances are brought about by a more complicated process. On account of the interrelationship of the endocrinal glands, the partial or complete withdrawal of the ovarian secretion from the circulation may and, in all probability does, induce changes in the function of the thyroid, adrenals, and pituitary glands. The vasomotor disturbances, therefore, may be the combined result of the functional changes of a number of endocrinal glands, the ovarian influence, of course, predominating.

Vertigo, as we find it during the menopause, comes on at irregular intervals. It may appear days and weeks apart and again may come on several times daily. During the time preceding the complete cessation of menses, when periods are still coming more or less irregularly, some patients are subjected to vasomotor disturbances during the menstrual flow only, while others suffering from such disturbances between the periods are relieved of them during the menstrual flow.

The character of the vertigo presents great variations, depending, in all probability, on the part or parts of the vestibular apparatus involved and on the severity of such involvement. The vertigo in some patients come on without any apparent cause, in others only after unusual movements or postures. Some patients asserted that they became dizzy after such slight motions as looking up, or down, straightening up, etc. Some patients complained of dizziness only on walking, while in others walking relieved the vertigo. Some were subjected to vertigo only during the day, others only during the night. Some would wake from sleep with vertigo, possibly after turning in bed. Others would become dizzy in a crowd.

In most of our patients the vertigo was of the objective type, *i.e.*, they experienced a sense of rotation around them of the visible or palpable environments. In some of them the vertigo was of a subjective type, *i.e.*, a sensation of motion of the body itself. A few of our patients described the vertigo as a sort of swimming move-

ment, a feeling of being intoxicated, an extremely embarrassing condition (the pseudonarcotism of Tilt).

Vertigo was seldom the only prominent menopause symptom; it was almost always accompanied by such disturbances as hot and cold flashes, cold perspiration, palpitation, blurred vision, flickering before the eyes, headache, nausea, tinnitus, etc. The relation of vertigo to climacteric functional hypertension is of interest, as it is claimed by some that it is responsible for the menopause vertigo. Excluding as far as possible the cases of organic hypertension (cardiovascular and renal) we found 102 cases with vertigo that had their blood pressure specified on their records, and of them only 45, or 46 per cent., had their blood pressure above 150, and only 20, or 30 per cent., above 160.

The severity of vertigo, of course, varied. In most of our cases, the vertigo was only slight, just a mild dizziness, in others again it was so severe that they feared walking by themselves on streets on account of the frequent falls and even loss of consciousness during the attacks of vertigo. The following case demonstrates how severe a menopause vertigo may be.

Mrs. B., school teacher, widow, aged forty-one, three children, youngest fifteen years. She was admitted to the Western Pennsylvania Hospital, July 13, 1915, for pronounced vertigo, metrorrhagia and digestive disturbances, with a history of appendicitis. These symptoms were of two years standing, previous to which time she was quite well. Examination of her cardiac, pulmonary, urinary, and nervous systems was negative. She had a lacerated cervix and small ovarian (left) cyst. Examination of blood and urine was negative, and a Wassermann was taken with negative results.

July 19, 1915, she was operated as follows: Curetment, high amputation of cervix, appendectomy, and oophorectomy. Since the operation, menorrhagia has irregularly continued. Flow lasted as long as six months at one time. Usually it was a slight oozing, but on some occasions this flow was rather profuse.

The most annoying symptom since the operation has been the dizziness mostly objective in character. During the attacks the objects move around the patient, and she has to lie down until, after vomiting, the dizziness disappears. Some of her vertigo attacks begin with a sensation of a crash in the head "as though hit by a board." She then falls down and the attack is over; occasionally it is followed by a crying spell. At other times the attacks are more severe. Such attacks usually come on just before the onset of a menstrual flow. She gets this crash on the head, falls down, and feels that everything is moving around her very fast. "Walls are going down, table, chairs, and bed coming up." She falls usually on the right side, but imagines that she falls on the left side. She closes her eyes after the fall and cries out. These falls are accom-

panied frequently by sensation of "blankness" on the left side of the body, by palpitation and tinnitus. Between the attacks she must avoid crowds. She cannot go to the theater or church. Cannot sit long in one place. When she begins to feel dizzy she has to stand up or walk.

As repeated examinations of her ears gave negative findings, and her vision, although not normal, was corrected with glasses, and as her blood pressure and blood counts repeatedly taken were found normal or slightly abnormal and her cardiovascular renal system showed no pathology, the vertigo was attributed to menopause and the patient was placed on ovarian substance, which seemingly, greatly improved the vertigo, but aggravated the menorrhagia. On stopping the ovarian substance during menstruation, the dizziness would become worse. For three years the patient has been taking the ovarian preparation, stopping it only during the attacks of menorrhagia, and getting great relief while taking it.

The treatment for the condition may be summarized as follows: Before any plan is decided upon, one must make sure that the case is one of climacteric vertigo. Such pathologic conditions as lesions of the internal ear or of any other part of the balance mechanism, such diseases as cardiovascular renal and ocular, especially muscular unbalance of eyes, must be excluded. If the case can definitely be diagnosticated as that of climacteric vertigo, the treatment must be that of menopause in general. As the metabolism is almost always below par in menopause, the nutrition and elimination of the patient must be looked after and, as the insufficiency or absence of the ovarian internal secretion is the underlying cause of the symptoms, ovarian organotherapy is logically indicated.

But we do not know as yet the active principle of the internal ovarian secretions; we do not even know definitely which part or parts of the ovarian substance (the Graafian follicle, corpus luteum or the interstitial cells) is responsible for the ovarian internal secretion or secretions. It seems plausible, therefore, that if by the administration of glandular tissue we can successfully replace a deficiency in internal secretion of the gland, the whole ovarian substance, in the present state of organotherapy, should meet best the needs of a menopause patient. We, therefore, prefer using the whole ovarian substance in our treatment of the climacteric disturbances in general, and vertigo in particular. The difficulty one meets in prescribing the ovarian substance is the lack of standard preparations. One must specify the name of the manufacturer or the proprietory name of the ovarian preparations to get the dosage desired. Thus, one manufacturer would base the dosage of an ovarian preparation on the quantity of the *fresh* ovarian substance in it, the others on the

quantity of the *desiccated* substance. Five grains, for instance, of the ovarian substance of Burroughs, Wellcome & Company is equivalent to 5 grains of fresh ovarian tissue, while the same dose of ovarian substance of Armour & Company, representing 5 grains of the desiccated ovarian tissue, is equivalent to 35 grains of fresh ovarian tissue. Even the same products of the different manufacturers that base the dosage on the amount of the desiccated ovarian substance do not represent the same quantity of fresh ovarian tissue. Thus 5 grains of the desiccated ovarian substance of Parke, Davis & Co. equals 30 grains of fresh ovarian tissue, 5 grains of same of Armour & Company, 35 grains, and 5 grains of Merck, 40 grains. Thus we find that the dosage of ovarian preparations on the market represents in some preparations the amount of the fresh ovarian substance, and in others the amount of the desiccated substance, and that the dose of the desiccated substance does not always represent the same amount of the fresh ovarian substance. This unsatisfactory feature of ovarian organotherapy should be corrected. The profession should demand standardization of the ovarian preparations.

In the treatment of our menopause cases we have been using a preparation, each grain of which represents a grain of the fresh ovarian substance (varium). The dose we used was 5 grains, two to four times a day. We rarely found any particular advantages in using larger doses. When this dose failed, we only occasionally obtained better results from larger doses. The results that we obtained from the ovarian substance in the menopause as shown in our records are about 37 per cent. improvement, and about 25 per cent. complete control. In some cases relief from vertigo preceded, in others followed, and in others again accompanied the relief from the rest of the menopause symptoms. The length of time the ovarian substance was used by the patients was variable, some used it just a month or so, others for many months, and one case for three years before the final cessation of the annoying symptoms. In most of the long cases the drug, during its use, would either improve or control completely the vertigo, but upon stopping its use this symptom would recur or become aggravated. The ovarian substance in artificial or advanced physiologic menopause simply supplies a substitute for the missing ovarian internal secretion and for this reason the substitute must be taken until a readjustment of the disturbed equilibrium, brought about by the loss of the internal ovarian secretion, is established. This last statement does not altogether hold good for the menopause symptoms before the com-

plete cessation of menstruation, for according to Hallion's law, an extract of an organ exerts on the same organ an exciting influence augmenting or helping to restore its activity. By the administration, therefore, of ovarian substance, while the ovaries are still functionating somewhat, we not only supply a substitute for the internal ovarian secretion but stimulate the ovaries to an increased production of it. If this is correct the earlier in the menopause the ovarian substance is given, the better should be the results.

The results obtained from the ovarian substance, while sometimes strikingly good, are so frequently negative as to raise the question whether it has within it the same finished product or products that the internal secretion consists of; and if it has, whether it is competent to take care of the functional changes of the correlated endocrinal glands brought about by the functional changes of the ovarian secretion. For it is quite generally accepted that, on account of the interrelation of the endocrinal glands, dysovarism induces changes in the functions of such glands as thyroid, adrenal, and pituitary. The apparent recent tendency to pluriglandular therapy is an admission that the ovarian substance alone cannot always meet the disturbances of dysovarism. It remains to be seen whether pluriglandular therapy can meet them better. So far an addition of small doses of thyroid extract to the ovarian substance in our treatment of the menopause seemed to have given us an occasional better result, and this seems to be in accord with the idea that thyroid atrophy follows the ovarian.

INTESTINAL ACTINOMYCOSIS.

BY

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Actinomycosis involving the intestine, although usually classified in the category of rare diseases, occurs with sufficient frequency to warrant more than a casual or academic interest in the subject.

The first case reported in America, of actinomycosis occurring in man, was published by the late John B. Murphy in the year 1885. Four years later, Rührah collected a series of fifty-eight cases from American literature. In his compilation of 1094 cases he places the percentage of occurrence of the intestinal variety of this disease at 20 per cent. This estimate is also in accord with the observation of Osler who made extensive studies of the streptothrix of actinomycosis.

The term actinomycosis is used to designate a condition of chronic inflammation caused by an infection with a type of streptothrix, which forms in the tissues characteristic small granules composed of the ray fungus. Their presence causes a new growth of connective tissue which later disintegrates. The condition may then assume the form of a subacute or chronic suppurative process.

The etiological factor in actinomycosis is a vegetable parasite which acts on tissues rendered susceptible by some condition which lowers their resistance. It is commonly known as the ray fungus, occurs in colonies, and forms masses of mycelium visible to the naked eye as whitish or yellowish granules. They may readily escape observation when mixed with pus or blood, which is an excellent reason why pus should be examined as a routine measure, especially when found in chronic lesions.

This type of parasite has been demonstrated only in the typical lesions of actinomycosis. Cattle have long been known to be subject to the development of this disease. Usually the infection involves the lower jaw and the condition in consequence is spoken of as lumpy jaw.

As the fungus of actinomycosis is parasitic on cereals and grasses, it is natural to suppose that herbivorous animals would be likely to develop the disease.

However, the affection may be found in other domestic animals, as well as in the bovine group.

The most probable manner in which the infection in man is acquired is through the food. There are on record a few cases in which the disease was thought to be contracted by the chewing of a blade of grass.

The streptothrix attacks the region of the mouth more frequently than any other portion of the body. Peribuccal actinomycosis is often associated with carious teeth, especially among those who disregard dental hygiene.

Actinomycosis of the digestive tract practically never occurs in the stomach or small intestine; possibly due to the acid contents of the stomach and the fluid secretions found in the small intestine which are less irritating to its mucous lining.

The colon, in the region of the sigmoid, but more particularly in the region of cecum and appendix, is found to be the seat of the primary infection. The streptothrix ingested with the food finds, in the colon, a *locus minoris resistentiæ* resulting from constipation, with consequent stagnation of the fecal current and a tendency to fecolith formation. We frequently find in the cecum stagnation of the intestinal contents and an increase of the bacterial flora, which may injure the mucous lining.

An acute or chronic inflammation of the appendix may open the door for the entrance of the actinomycotic organism.

In general, it may be stated, that actinomycosis is practically never carried by the lymphatics and but rarely by the blood stream. The method of extension is by continuity of tissue. Thus it is that general actinomycosis, unlike tuberculosis and blastomycosis, is extremely rare.

It is true that frequently lymphadenitis is present but it will be found that in these cases, the glandular involvement is secondary to a complicating pyogenic infection.

The gross pathology of intestinal actinomycosis consists of a mass of indurated connective tissue, with one or more areas of suppuration, the pus from which contains the characteristic granules; later fistulæ or sinuses develop, the secretions from which contain the fungus.

Many of the abdominal organs may become involved with the disease, as extension of the process usually takes place through retroperitoneal tissues; sometimes destroying muscular and even bony

structures. Extension may take place along the psoas muscle into Scarpa's triangle and involve the hip-joint. Pressure of the growth on important nerves may produce severe and continuous pain.

The early diagnosis of actinomycosis is generally overlooked. A firm swelling, painless on pressure, occupying either the right or left inguinal regions, usually the right, is the sign most frequently found in cases of intestinal actinomycosis.

In those cases in which the internal organs are involved, there is fever and marked disturbance of nutrition and the symptoms are those of a chronic wasting disease, associated with fever.

In other cases, there may be pain extending down the thigh due to irritation of the lumbar plexus of nerves by pressure from the connective tissue growth or infiltration of the psoas muscle and for the same reasons persistent flexion of the thigh may result.

The disease may be acute or subacute at the onset, but it is essentially of a chronic nature. In the acute form, it may begin with an acute inflammation of the appendix with the formation of a mass in the right iliac region. The appendix may or may not be found perforated or gangrenous. The tissues about the appendix may seem to show only inflammatory deposits.

Should the case be drained, the postoperative sinus resulting does not heal readily; vascular granulation tissue forms and induration of the walls of the sinus due to an increase of the connective tissue is observed. The odor of the discharges from the wound is foul and, if the pus be carefully scrutinized, it will be found to contain granules as though it had been sprinkled with bird seed. These granules vary in consistency, some are quite soft, while others feel hard to the touch. Examination with the microscope will demonstrate that these actinomycotic granules contain the ray fungus. The granules may not be found in the pus in every stage of the disease, hence the importance of repeated examinations. When the granules are very small, the pus from a secondary infection may resemble the contents of an abscess due to staphylococci or other septic organism. When a large soft focus is opened, it presents a very characteristic appearance due to numerous, small, yellow granules, which permeate the flabby granulation tissue.

The onset is more insidious in the chronic form of the disease and the infection may become extensive before its true nature is discovered.

A third type of the disease, rare, but interesting, is one in which an inflamed appendix which has not perforated has been removed and is found to contain the streptothrix of actinomycosis.

At times, it is difficult to differentiate actinomycosis from other conditions which simulate it. Those cases in which there is a soft mass, leading to abscess formation, are by far the easier to diagnosticate as the typical streptothrix is usually found in the pus.

The indurative type of this disease must be carefully differentiated from fibroma, osteoma, carcinoma, or sarcoma of bone. The Röntgen ray and the microscopic examination of a portion of the suspected mass may be necessary to determine definitely its nature.

The so-called soft type of this disease may simulate septic, syphilitic, or tuberculous inflammatory processes. Septic processes may be excluded by the fact that they are more acute in their onset and more painful; and usually respond promptly to appropriate surgical measures, and, even in unfavorable cases, the infection assumes the form of a general toxemia quite different from any manifestation of actinomycosis.

In tuberculous lesions the lymph glands are usually enlarged, there are commonly multiple foci, the course is less acute than in the case of actinomycosis and the discharge is thin, caseous and odorless, while in the case of actinomycotic lesions, the discharge contains granules, and the odor is foul. Microscopic examination of the discharge and of sections of the involved tissue will definitely decide the diagnosis.

In differentiating actinomycosis from syphilitic lesions, we should bear in mind that a gumma is not painful in its development, as is the growth in some of the more acute cases of actinomycosis, and progresses much more rapidly. The ulcer which forms when a superficial gumma breaks down is unlike any of the varied manifestations of actinomycosis. Further, in syphilis, no granules are present in the material discharged and the Wassermann test is usually positive. It must be carefully borne in mind, however, that a positive Wassermann test does not exclude actinomycosis. Cases of tertiary syphilis, in which there is present a large amount of dense fibrous tissue, may simulate closely the indurated type of actinomycosis, and differentiation by the therapeutic test with potassium iodide is impossible as this drug is markedly beneficial in both syphilitic and actinomycotic lesions.

As a rule, the disease lasts for months and may even be prolonged for years and is especially unfavorable in the abdominal type of the infection. Recovery is always slow even in the favorable cases.

The complications which may ensue are many and varied, the most important of these being metastases in the liver; strangulation of the intestine, necessitating at times anastomoses; suppurating foci,

resulting in abscesses between the coils of the intestine; and fistulæ. Of these complications, the metastatic involvement of the liver is, perhaps, the most serious and the outlook in these cases is very unfavorable.

Large masses may form in the planes of the connective tissue behind the colon, pushing it forward, and these masses may extend up to the diaphragm. The connective tissue of the anterior abdominal wall may be involved as far as the umbilicus. An irregular temperature is the rule, the rise in temperature being due to a secondary infection. The patient may become markedly anemic and in fatal cases, death results from exhaustion.

The surgical measures to combat the disease consist of, in some cases, excision, in others, incision, and cureting of diseased tissues together with the use of antiseptics and the maintenance of free drainage. Injections of 4 per cent. formalin solution have been employed with success. Vaccines and serums have been found of value only in a few reported cases. The *x*-ray has not shown any marked beneficial effect. In a few instances radium has been given with marked immediate results.

Large doses of potassium iodide, 90 grains three times a day, have been given with success in many cases. Some authors have been so favorably impressed as to assert that it is a specific in this disease. The marked efficacy claimed for this drug is readily explained by the fact that it promotes the absorption of granulation tissue, acting in very much the same manner as in the case of granulomata of tertiary syphilis.

Some prefer to administer it for four days, and then omit it for a week, again repeating the dose for four days, on the theory that if the drug be given continuously, the growth of the spores of the organisms is inhibited, and these spores later, when the treatment has been discontinued, will mature and cause a reinfection.

Case Report.—Mrs. W., aged thirty-five, was admitted to my service, February 9, 1917, with the following history:

Five months ago she fell and injured her spine, but was able to be about in a short time. Two weeks ago she was taken with general abdominal pain which in twenty-four hours was localized in the right iliac region and groin. There was no chills, fever, nausea, vomiting or urinary symptoms. She was treated by an orthopedic surgeon for sacroiliac disease. An *x*-ray plate showed no bone involvement.

The pain has persisted since, with slight remissions, and radiates down the front of the thigh. The leukocyte count was found to be 14,000. Examination of the abdomen reveals slight general rigidity but no muscular spasm. A hard mass can be palpated in the appendical region.

February 10, 1917, under ether anesthesia a bimanual examination was made. The uterus, tubes, and ovaries were found normal and freely movable. An immovable mass, the size of a lemon, could readily be felt in the region of the cecum. This mass was very hard and appeared to be an enchondroma of the ilium, or an inflammatory mass about a diseased appendix. A split muscle incision was made in the right iliac region and upon entering the peritoneal cavity a small amount of clear fluid escaped. The mass was found to be an appendix surrounded by what appeared to be chronic inflammatory tissue. The appendix was removed and the stump crushed, ligated and inverted. The pelvic organs were found normal. A rubber tissue drain was placed down to the stump of the appendix and the wound closed about it.

The pathologist reported: "Chronic inflammation of appendix. Multiple abscesses in granulation tissue around the appendix."

The wound continued to discharge longer than is usual and considerable connective tissue formed about the sinus. The patient was again anesthetized on April 4, 1917, but the vaginal examination showed no involvement of the pelvic structures. Exploration of the sinus revealed a large cavity which reached under Poupart's ligament into Scarpa's triangle and to the psoas muscle. No denuded bone was found, but the cavity was filled with caseous necrotic tissue, containing granules, yellowish in color and about the size of bird seed. A counter-incision was made below Poupart's ligament, and the wound packed with iodoform gauze.

It was found necessary to manipulate freely the hip-joint, as the thigh had been flexed upon the body for some weeks, due to the fact that extension caused pain. Normal motion of the hip-joint was readily obtained.

The pathologist reported that the examination of the material removed from the sinus showed actinomycosis. The patient nine days later entered Mount Sinai Hospital, N. Y., where she was treated for five months.

I saw the patient again on September 10, 1918, and found her to be in good general condition and able to do considerable work. The sinus still discharges about 3 drams of pus daily.

We should think of actinomycosis when we are dealing with any subacute or chronic swelling in the region of the face, neck, thorax, or abdomen, and examine the tissues or secretions for the streptothrix of actinomycosis.

PROBLEMS OF URETERAL SURGERY IN GYNECOLOGY.

BY

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In this short paper discussion will be limited to problems dealing with injury to, and stone of, the lower ureter in women.

Injuries to the ureter during operation are fairly frequent and when recognized at the time should, if condition of patient warrants, be immediately repaired. Too often, however, these accidents occur when the patient's resistance is much depleted by the ravages of disease, added to which is the shock of a major operation, in which case one is not justified in prolonging the operation unless the injury is slight and located at a point where repair is easy. As a rule, repair is not easy, in fact, good judgment and ingenuity are called for in this field of surgery. The problem of transplantation is often puzzling and removal of the kidney may be necessary. In post-operative cases another problem often perplexing is the locating of the origin of the leak. The diagnosis of the existing stone in the lower ureter, too, is often not made, and the question of the best method of approach for its removal may become good food for thought.

Injury to the pelvic ureter may be traumatic or surgical. If surgical, it may be from accident or by design. If the latter, it may have been necessitated by pathologic changes in neighboring structures or existing defects in embryologic development. Consideration of the embryologic type scarcely comes within the scope of this paper. Because of the elasticity and protected position of the ureter, it is peculiarly free from ordinary traumatic injury. Morris reports five cases from literature. Since then from his own practice Hunner reports one.

Because of the uncertainty of the symptoms in these cases, it is said that an early diagnosis is difficult, if not impossible. But to-day with the non-toxic, radiographic materials at our command, we should be able to demonstrate the origin of the leak. On account of the anatomic relations of the ureter in the pelvis, in marked con-

trast to the relative immunity from the traumatic injury, is the danger to the ureter from surgical injury. The broad ligament portion is particularly subject to injury when operating for cancer of the cervix. The type of cervical involvement, where the danger seems greatest, is where the growth is low in the vagina and the broad ligaments are entirely free from the inflammatory reaction. Here, if the surgeon proceeds on the assumption that the case is unusually easy to handle and ignores the ureter problem, he may find later that he should have proceeded more carefully, by isolating the ureters at the beginning of the operation, as should be done in all cases of carcinoma of the cervix operated on by the abdominal route. If the ureter appears to be involved in the growth, a portion may be resected and bladder implantation done. It has been my experience during the removal of a large left intraligamentary cyst to tear the ureter. It was hard for me, at first, to believe that, in spite of the caution exercised, such an accident had occurred. Indigo-carmine was injected intramuscularly, and the original operation continued. In six minutes blue-stained urine was coming from the torn ureter confirming our suspicion. A ureterovesical anastomosis, after the method of Furniss, was done with excellent results. The ureter had been torn free for about 3½ inches. A full inch was drawn into the bladder and the remaining injured portion carefully covered. The restoration of function was immediate, and the fact that repair was rapid leads me to believe that when the main artery to the ureter is preserved, the ureter probably has better powers to repair than is generally attributed to it. Postoperative ureteral leaks are of recent years being encountered more frequently in consequence of our more radical procedures in pelvic operations.

To-day with the dominance of hysterectomy by the abdominal route these injuries usually occur under the eye. However, where the vaginal route is used the ureter is frequently injured. The only safe way here is to have the bladder wall isolated at the ureterovesical attachments before proceeding to tie or cut the broad ligaments. During simple vaginal drainage I have seen one of our leading gynecologists injure the ureter. This accident would not have occurred had he punctured for drainage instead of using knife and scissors.

Several years ago, while operating for an extensive tear of the cervix, one stitch taken high in the left side of the cervix chanced to include the ureter. The day following my patient complained of pain in the left kidney region. Examination revealed tenderness on that side with apparently some enlargement of the kidney.

At cystoscopy an attempt to enter the ureter by catheter failed and no urine was seen to come from that side. Indigo-carmine was used with the return from that side. The ligature under suspicion was then cut and removed. After waiting a few minutes, still no urine appeared. Again the catheter was tried and could now be passed. The stained urine then came freely. Immediate relief and prompt recovery followed.

Another causative factor which is not so productive at once, but which still occurs, is the use of instruments in delivery. At present I have under observation a woman, a multipara, who in her last childbirth, four weeks ago (instrumental), had her vagina and bladder torn, leaving a vesico-vaginal fistula as large as a twenty-five-cent coin, at the same time, the whole urethra was torn away. The condition of the ureters has not yet been determined.

In another case seen only at autopsy an almost unbelievable thing had occurred. Here from applying forceps external to the cervix both ureters along with the uterine arteries were completely severed. The patient died in the ambulance *en route* to the hospital. Injury to the ureter may be due to pressure from the child's head. If caused by the forceps, the leak is immediate, whereas, if the child's head is the offender, the leakage may not ensue for several days, that is, until necrosis has developed.

The order of frequency in the usual injuries are ligation, clamping, kinking (by ligature or clamp) incision (partial or complete) resection of portion of ureter (accidental or designed) and interference with the blood supply leading to necrosis.

The results from closure of one ureter, as well as from obstruction due to calculi in the urinary tract, vary to all extremes. With one ureter closed you may have no symptoms whatever; it may be followed with toxemia and death. The extremes of end results in obstruction from stone in the urinary tract are well illustrated by the two cases which I report briefly.

Case I.—Mrs. K. K., housewife, aged twenty-six years, has had one pregnancy with normal delivery. Child's age, eight years. Menses always normal. General health good, except for hemorrhoids, which had existed for seven years, and which were operated upon June 2d. Three days after leaving the hospital, about fourteen days after operation, she was taken with pain of intense character over left lumbar region extending down left side and inner thigh. Initial attack on Saturday. The following Tuesday she had chill, temperature 104°. Intense pain in left side radiating to left inner thigh and labia. Urinary findings negative. After several such attacks she entered Providence Hospital July 3d. Temperature varied 100.6°

to 103.6°. She had a badly abscessed tooth, otherwise physical examination was negative except for tenderness over left side of abdomen and kidney. Laboratory report; Urine (catheter specimen) straw color, specific gravity 1010, reaction acid, albumin and sugar negative. Phosphates and triple phosphate crystals. White blood count 5625; polymorphonuclears 64 per cent., S. M. 30 per cent., L. M. 5 per cent. Direct smear from left ureter shows presence of a few bacteria with polymorphonuclear leukocytes predominating. Cultures show pure staphylococcus albus. *X*-ray of urinary tract was ordered for suspected renal stone. Report: Shadow of what seems to be a stone seen at lower end of left ureter. Size about 6 × 9 m.m., D. G. C. Chene.

July 4th, cystoscopy, bladder normal. Right ureter meatus normal and urine in normal whirls. Left ureter congested and no urine from this side. Catheter passed and at 5 cm. meets with obstruction, upon pressure obstruction is passed, when suddenly there is a gush of pus through and around the catheter. The flow into the bladder is so abundant as to completely cloud the field. This was immediately followed by relief from pain. Pain returned next day.

July 5th, four days later, after a chill followed by high temperature, catheterization was again done, when a large amount of pus was drained off, sufficient in amount to overflow the large test tube used. Temperature dropped. Chills did not recur and pain ceased.

July 10th, urine cloudy, was coming from this side, the kidney pelvis was irrigated with boric acid solution. The capacity of pelvis was found to be 35 c.c.

July 15th, 15 per cent. silver nitrate solution was used for irrigation of pelvis and on July 18th was repeated.

July 20th a 2 per cent. solution was used for the same purpose; at this sitting flow of urine was abundant and clear.

July 22d, operation was performed and a stone 6 × 9 mm., much roughened and very adherent to the ureteral, was located and removed from a point about 5 cm. above the bladder. The patient's wound remained clean. She made an uninterrupted recovery and left the hospital August 9th, the eighteenth day. It is interesting to note here that the urinary findings from catheterized specimen, when patient entered the hospital, was normal. Due to the fact that no urine was being excreted from the left kidney, the pus pressure evidently was sufficient to prohibit the manufacture of urine on that side. It is also interesting to note that upon August 8th, the day before her discharge from the hospital, a functional test showed the capacity of the kidneys to be equal.

Case II.—Through the courtesy of Dr. James E. Davis I am privileged to report this case. For him I did the cystoscopy and ureteral findings. Mrs. M. S., housewife, aged forty-two years. Married for nineteen years and has eight pregnancies. One miscarriage occurred at two months, and one at five months. One premature labor occurred at eight months; the child lived but five days. One child died at five months of age from convulsions. Four children are living. The regular body functions have been normal.

The menstrual history began at twelve years and continued normal until affected and suppressed by a recent illness.

The family history was negative, excepting that one sister died of erysipelas and one died of appendicitis. The patient had not been ill previous to her childbearing period. During her puerperiums she had two infections with local manifestations of phlegmasia alba dolens.

One pregnancy was interrupted at five months by a kidney insufficiency; there being almost total suppression of urine at this time. Following this miscarriage there was infection and a long tedious convalescent period lasting three months. During this period there was marked soreness over the right kidney.

It is to be noted that during a pregnancy two years previous to the one just described, there was a noticeable diminution of the urinary output during the eighth month. Delivery, however, was made at nine months of a living child. In 1905, the patient had a single attack of acute appendicitis for which she was operated, and recovery was prompt and uneventful.

In August, 1915, an edema of the right foot and leg, with pain in the back, appeared with recurrences at regular intervals for about one year.

In June, 1916, a chill with fever and pain in the back came on suddenly. Shortly after this time, on the 28th of June, 1916, she entered Providence Hospital and was operated on July 12th, by Dr. Y. for kidney calculi and abscess. A pint or more of pus with numerous calculi were removed through the abdominal route. A second operation was done in September, 1916, for drainage for perinephritic abscess. The patient left the hospital October 3, 1916, but reentered five weeks later because of a recurrence of the perinephritic infection. At this time the patient entered the service of the writer. At operation ½ liter of offensive pus was evacuated *via* the postlumbar route. The pus cavity was definitely and thickly walled off and appeared at the position of the lower pole of the right kidney. About six weeks later, or on January 4th, when the leukocyte count and general clinical evidence pointed to freedom from purulent infection, an exploratory incision was made for the purpose of removing tissues causative of the repeated abscess formations. It was found that there was no remaining kidney tissue and the tissues surrounding the end of the ureter, which was patent, showed marked cloudy swelling with some areas of fibrous change. Removal of the pathologic tissues was made as thorough as possible and catheterization of the urethra was attempted. Obliteration of the ureter was not accomplished by the cauterization as was shown by catheterization a few weeks later and the injection of collargol through the catheter. The collargol was observed passing freely from the end of the catheter to the outer opening of the sinus through the epidermis in the postlumbar region. The patient made a prompt recovery after this last operation and has remained in good health to the present time. For a period of about eight months since the operation collargol or argyrol has been injected into the sinus about once every seven days; about 10 or 20 c.c. being used at each injection.

For a period of nine months the injected silver solution, which previously was emptied in part into the urinary bladder, now is retained in decreasing quantities within the sinus.

Upon four different occasions bismuth injections have been made in an attempt to close the sinus. Closure of the sinus as shown by the radiogram is slowly taking place.

The drainage from the sinus, excepting in the early weeks following the operation, when it was serious in character, has consisted almost entirely of the injected material. The patient has gained markedly in weight and has suffered from discomfort only when drainage from the sinus was inadequate from closure or partial closure of its external outlet and occasionally from slight inflammation in the dermal scar tissue.

Urological Report.—June 7th, 8.00 A. M. In cystoscoping this case, the bladder wall is normal in appearance except that the meatus of the right ureter is much enlarged, round, open, and quiescent. The catheter size (No. 7) was readily passed into the ureter for a distance of 15 cm. We waited a few minutes for secretion of urine and none appeared. Then an injection of argyrol 10 per cent. was made. When 1 cm. of the solution was injected the patient complained of pain to such an extent that no further effort was made. After waiting fifteen minutes it was found that none of the fluid passed through the sinus in the back. Before catheterizing the right ureter it was noticed that the meatus of the left ureter was slit like and normal in appearance, and that the urine was flowing freely in normal spurts.

Comparing the condition of the right side with the findings of a year ago it was found that the condition had very materially changed, the purulent discharge being markedly less; also that the fluid would not pass from the catheter out through the back as it did one year ago. It is interesting to note here that destruction was not only physiological but that the pathological changes had resulted in a complete obliteration of the kidney anatomically.

The etiology of ureteral calculus is not yet definitely settled. It is probable that the infection in most cases is secondary. The majority are colonic, due to mechanical obstruction and stasis. Cabot says "our former conception has been that the stone was primary and its surrounding infiltration secondary. I have several observations that tend to show that the deposit of urinary salts is secondary to the disease in the ureter walls."

The diagnosis of an existing ureteral stone when suspicioned is often not easily made. One cannot depend on the urine examination. *X*-ray examination should always be done. Negative findings are not conclusive for many reasons. *X*-ray and urinary findings are probably the greatest source of error.

Pain may be intermittent and severe in the kidney region, but constant and mild in the stricture area. By the congestion of the

menstrual period, getting wet feet, chilling or catching cold, these attacks are often erroneously diagnosticated as ovarian attacks.

Of stones in the ureter the largest number will be found lodged in the lower $2\frac{1}{2}$ inches of the tube. Before operating for this condition expulsion of the stone may be sought for by the injection of a local anesthetic which may relieve the ureteral spasm. The theory of the use of an anesthetic solution has merit. Papaverine employed as follows appears to be of benefit: A catheter is passed into the ureter to the stone. Papaverine hydrochloride 5 c.c., 2 per cent. solution or 5 c.c. of the sulphate is injected. The stone will pass without pain and when the use of lubricants has failed. The use of lubricants, it would seem, is often dangerous and scarcely if ever useful.

If for any reason, such as the stone being rough and buried in the ureteral wall, the manipulations fail, we then resort to operative measures either cystoscopic or cutting. There are four avenues that confront us in selecting our method of approach, transvesical, vaginal, transperitoneal, and extraperitoneal, each of which has its special indications, depending upon the location of the calculus. These principles, however, hold. Do not cut the ureter directly over the stone. Make the incision at a point remote, and as can usually be done. Milk the stone into the opening. Do not open the peritoneum if avoidable. If opened accidentally it may offer an excellent guide in locating the stone, closing the peritoneum before opening the ureter. Incise the ureter longitudinally. Stitching the ureter is not necessary since repair is rapid when the tube is not injured transversely.

No form of operation is ever done until as complete an investigation as possible of both sides has been made. This having been done, we are ready to begin our repair work. Here the surgeon should fit his action in every case to the condition of the patient and the exigencies of the injury.

Division of the ureteral orifice or dilatation are applicable to stones arrested in the intramural portion of the ureter, this procedure is not simple and requires a high degree of skill. If the stone is partially protruding, it may be grasped by forceps and extracted. If directly inside the ureteral orifice, it may be simply snipped in its upper surface which will probably be sufficient. If this later procedure fails, it should then be removed by cystostomy. A stitch later on may be needed to control the bleeding. Vaginal ureterotomy has a narrow field of usefulness since it is only satisfactory where the stone can be readily felt by palpation and does not slip

back upon manipulation. Furthermore, it can only be carried out in the parous woman.

For stone in the lower third of the ureter, but outside the bladder wall, an incision above but transperitoneal, which gives access to the ureter is the one of choice.

As before stated, ureteral injuries incurred during operation should be discovered and cared for at the time, the care depending upon the condition of the patient and the character of the injury. If from ligature, the ligature should be cut. If from forceps, simple removal will likely be followed with healing unless catheter has been placed previously and is broken in two by the forceps. Then incise ureter longitudinally, withdraw catheter, and apply a few stitches or one may then pass catheter out through the bladder for a few days until wounded ureter has healed.

Injury of the ureter during a hysterectomy or other major operation often means sacrifice of the kidney of that side and may be the death of the patient. If one does not feel reasonably sure that repair can be accomplished, it is better not to attempt it as such efforts often result disastrously. For instance, if kidney infection has occurred, removal of the kidney would under such circumstances be better. Or what may be done in some injuries is to ligate the ureter and drop it. In either of these procedures it is obvious that one should know if there is another kidney and if so its condition. In ligating the ureter is should be doubly ligated. The ligatures should be placed half an inch apart when the intervening portion becomes a solid fibrous cord. These ties should be of chromic catgut and should be applied not too snugly, so as to crush the ureteral walls. When this is done the kidney continues to secrete urine until its pressure in the kidney is equal to the blood pressure in the kidney; the urinary salts then being absorbed and the urine aqueous. It has been observed on animals whose ureters have been tied that glomeruli of the kidney retain their secretory power after two years, as is shown upon removal of the obstruction. In the human, after complete obstruction lasting for ten years, upon removal of the obstruction the thinned out lamina of the kidney cortex has shown secretory activity.

It is surprising to what degree a kidney may be dilated without becoming infected. And the destiny of a kidney whose ureter is tied cannot be easily foretold. At least, the kidney hormones are retained.

Before attempting the repair of a fistula it is often better to wait for a time, and see if the leak will not stop spontaneously. The

probability of spontaneous healing can often be told by noting a diminution in the leak and determining the location of the fistula. A review of the operative work done will frequently suggest the probable location of the injury. The exact location is not always easy to determine. A vaginal and cystoscopic examination supplemented by indigo-carmine, will usually give the desired information, but these may need be supplemented by the *x*-ray. For obtaining a cystogram or ureterogram my choice of solution opaque to the röntgen ray is one either of sodium or potassium iodide, 15–30 per cent., either being inexpensive, easy of preparation, does not give precipitate when mixed with urine or blood-tinged urine, is nonirritating to the bladder, ureter, or kidney, and gives a splendid shadow. It must be remembered that the point at which the catheter is obstructed is not always the location of the fistula. The catheter may have met a kink (old angulation), or else the distal end of the kidney portion of the severed tube may be higher up than where obstruction is met by the catheter. Again, it may be passing into the vagina or beyond the leak into the pelvis of the kidney.

The fistula having been located, the function of each kidney should be determined. If the function is low on the side of the injury, or infection marked, with the other kidney good, a nephrectomy should be done. With good function on the injured side repair is indicated even in the presence of a slight infection. After the ureteral repair kidney function and sepsis will improve. The contraindications for anastomosis are carcinomatous recurrence or kidney with marked infection.

The most opportune time for doing an anastomosis that was not completed at the primary operation is as soon as possible after the exudate around the fistula has disappeared. Waiting is useless, if, after eight weeks, the dribble is not becoming less.

As a choice of methods. If detected during a hysterectomy for carcinoma of cervix, the hysterectomy should be completed first. This gives more room for repair and less danger of harming the repaired area. The rule is, where feasible to do a ureteroureteral anastomosis (Bovée) an invagination of the upper cut end into dilated lower end (Poggi) or an end to end anastomosis (Van Hook). There are various modifications of these, my preference being the end to end over a segment of catheter (Hunner).

If it is not feasible to anastomose the ends of the ureter, the the next step is to attempt a ureterovesical anastomosis. In case the ureter is too short, the bladder may be elongated after the method

of either Witzel or Bovée. The anastomosis is preferably done after the method of Furniss (Trans. A. A. O. & G., 1917). The nearest fixed point of the bladder is chosen. If too much of the ureter has been destroyed to do a ureterovesical anastomosis, then one must resort to the choice of implanting the ureter into the skin, doubly ligating the ureter and dropping it into the abdomen or doing an implantation into the colon. Here the mortality becomes very high, but is lessened materially by the physiological transplantation of coffee. The intestinal implantation should be in the big bowel since in the small bowel the urine is absorbed giving urosepsis. A diluted or infected ureter should be turned to the skin and not into the gut.

If the decision is in favor of the ureter into the bladder, this may be done by the vaginal route if the fistula is in the vesicle portion. I, personally, do not favor this operation because of the stricture that is sure to follow, necessitating a later nephrectomy. The operation of choice for any ureterovaginal fistula is, I believe, a ureterovesical anastomosis.

CONCLUSIONS.

I. The problem of transplantation of the ureter is often puzzling.

II. In hysterectomy for malignancy of the cervix one should always isolate the ureters early.

III. *X*-ray and urinary findings are probably the greatest source of error.

IV. In urology the solution, of choice, opaque to the röntgen ray, is one either of sodium or potassium iodide.

V. The destiny of a kidney whose ureter has been closed cannot be easily foretold.

VI. No form of operation is ever done until as complete an investigation as possible of both sides has been made.

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DISCUSSION.

Dr. A. B. Miller, Syracuse, New York.—I will take just a moment to refer to a portion of the technic which is not made plain to me, that with reference to cutting ligatures where the ureter had been tied accidentally during operations.

As one of the pioneers in this department of surgery, I remember in our early experience the cases of large fibroids, where the ureters passed through the growths and we were embarrassed by the pressure and conditions that we are not seeing so much at the present time, because the education which our younger men are receiving in college and elsewhere is so different from the way in which these subjects were presented to me. The fibroid tumors to-day are not allowed to grow as large as they did then, and we are not seeing cases which embarrass the operator.

The suggestion which I want to present came to me through one of the cases in my earlier experience with a large fibroid which, like the elbow of a stovepipe, filled the lower portion of the pelvis, extending down upon the perineum, and rising in the abdominal cavity above the umbilicus, so that it was difficult to decide by what procedure these conditions could be alleviated. The tumor proved to be one of the retroperitoneal type. In opening the abdomen very little difficulty presented itself in carrying out the operative technic. The peritoneum was separated over the growth, the latter freed and by traction drawn out through the abdominal incision. The pelvis was thus relieved from pressure, the operation proved to be a comparatively simple one for such a large fibroid. It was spectacular in the extreme. But regardless of that, and feeling that a slight amount of hemorrhage would take place subsequently, ligatures were applied freely, and with the supposed feeling that no injury could have been done to the ureters. The operation was done in a neighboring city, and within twenty-four hours after the operation I was told over the telephone that the patient was not urinating. I advised waiting a little time longer, believing that possibly it was one of those cases where there was an arrest of urination and the condition would be sooner or later relieved. After six or eight hours more the patient still not urinating, although her general condition was good, I found on investigation that I had incorporated one or both of the ureters in the ligature. On reaching there I found that the patient was comfortable and we waited until the morning when I revisited her at the hospital. Our methods were at that time rather crude as compared with those of to-day, but regardless of that, I thought a secondary operative procedure necessary. Instead of resorting to another abdominal invasion the woman was turned over on the bed, cocain was injected into the lumbar muscles and an incision made under local anesthesia, rapidly reaching the ureter, and I did what I would not do in a subsequent condition. The ureter came into view readily and quickly; the time spent was not more than twelve minutes, and the ureter was incised longitudinally and relieved. Thinking possibly this would be sufficient to take care of the patient, and finding

she was relieved, I left her, but after four or five days, with tumefaction occurring on the opposite side, I tried to see if something could not be done with the opposite ureter. The same procedure was practised; the same aseptic precautions were taken, and the patient's general condition was good. Cutting down through a lumbar incision I was able to reach the ureter without any difficulty, and it was taken care of the same as the first one. This patient left the hospital at the end of six weeks, and I expected, if necessary, to do repairs of the ureter. She was comfortable and returned to her home. The ureter was tied with catgut which had absorbed, so that some of the urine was going into the bladder. After four months she was taken ill with pneumonia and passed away.

If I had had time to consider any of the literature upon the subject regarding this procedure, and I had carefully cut down through the lumbar incision, I could have untied the ligature which was binding the ureter and relieved her without having to repair either ureter. This is merely an experience.

In our early Transactions you will find a report of a similar case presented by the late Dr. Frederick who had the unpleasant experience of cutting the ureter, but cases were not reported then as they are now. He subsequently did a lateral anastomosis of the ureter and the patient lived for ten or fifteen years subsequent to that operation. I remember at the time I was interested in the case, and ten or fifteen years afterward I was called to see the patient and she was dying. She was not dying as a result of kidney trouble, but she had a large growth, a hypernephrotic kidney which had undergone degeneration, but probably for several years after his repair by anastomosis that woman was given some relief, although his methods of repair may not have been as good as they are to-day.

Major Robert T. Morris, New York City.—Dr. Miller has evidently given us a good new point, that of relieving the ureter by a longitudinal cut when the ureter has been included in the ligature. I hope I will not have occasion to try it, but, it seems to me, after we have ligated with catgut, and then relieved the ureter at any point, the catgut will become absorbed finally and the urine will follow its natural inclination along the ureter. I had a parallel instance in the common bile duct in a case in which I was called in consultation. The surgeon had gone so far down that he included the common duct, and we decided we must operate, and we did. He had included an abnormal loop of the common bile duct, and it was ligated with catgut. If we had waited a few hours longer the bile would have taken its natural course because the catgut was almost absorbed.

Dr. K. I. Sanes, Pittsburgh, Pennsylvania.—Dr. Brown mentioned the fact that in case of vesicovaginal fistula he tries to find the vaginal opening in the ureter with the aid of a ureteral catheter. I want to mention in this connection, an experience I had while attempting to find such a ureteral opening. During a hysterectomy with forceps, one of the blades broke. In applying another forceps I must have caught part of the ureteral wall with it. On the sixth

day after the operation, a vesicovaginal fistula was discovered. I put the patient on the table and tried to find the opening with a ureteral catheter. As I entered the ureteral opening, a gush of blood came from the catheter. The catheter was in the uterine artery instead of the ureter. Of course, I immediately opened the abdomen and made a vesicoureteral anastomosis.

I would like to say a few words regarding unilateral pyuria. In cases of pyelitis a clot of pus occasionally becomes arrested in the ureteral tract, and causes symptoms simulating those of ureteral stone. For this reason, we should radiograph every patient with a suspected ureteral stone, after passing up an *x*-ray catheter into his kidney. If no stone is found in the radiogram and the ureteral urine specimen shows the presence of pus, we may assume that the ureteral obstructive symptoms are, in all probability, due to a clot of pus arrested in the ureteral tract.

It is remarkable how frequently cases of pyelitis get permanent relief from ureteral catheterization. While frequently in such cases we inject collargol into the kidney, we doubt whether the collargol contributes much to the good results.

It is important in cases of unilateral pyuria to exclude tuberculosis by microscopic examination and by guinea-pig injections of the urine before instituting any treatment of the renal pelvis.

In catheterization of ureters, one frequently meets obstructions in the lower ureter. Such obstruction is sometimes due to constrictions which may successfully be dilated with ureteral sounds. It may also be due to a ureteral stone. Such a stone may sometimes, after dilatation of the ureter with sounds, come down into the bladder. A good rule, therefore, is as follows: If the sound passes through the obstruction or passes by the stone a gradual dilatation of the ureter should be instituted until the constriction is completely dilated or the stone comes down.

My first experience with a successful removal of a ureteral stone by a catheter was in a patient who came to me for the removal of a low ureteral stone. I cystoscoped her, passed the catheter up into the ureter and located the stone. She was prepared for operation, but before the patient was taken to the operating room, we found the stone in the voided specimen of urine.

Dr. Julius H. Jacobson, Toledo, Ohio.—There were three points in this excellent paper about which I wish to speak. The first one is regarding injuries to the ureter during hysterectomy. In operating for malignant disease, I have been using Bumm's method of locating the ureter to avoid injury to it. In all pelvic operations where there is some question as to the location of the ureter if an incision is made between the round ligament and Fallopian tube, by blunt dissection, we can quickly, without the ligation of a single vessel, get down to the ureter in the broad ligament and push aside that part of the ureter that is in danger. It is a procedure which is quickly done, it only requires about a minute or two to locate the ureter. If this method were more generally practised, it would do away with the danger of injuring the lower end

of the ureter in hysterectomy. The old method of locating the ureter by making an incision on the posterior aspect of the broad ligament is more difficult.

Dr. Hayd.—Do you mean by blunt dissection, incision about the round ligament and Fallopian tube?

Dr. Jacobson.—Bumm's modification consisted first in ligating the ovarian vessels and then making the separation of the broad ligament. With that incision you come down quickly and locate both ureters and uterine vessels.

The second point is with reference to a method which we have found very useful in one case. It is that which Lespinasse, of Chicago, has elaborated. It consists in ureteral dilatation for stones impacted in the lower end of the ureter. The method which Dr. Sanes spoke about is the classic method, and all stones implanted in the lower end of the ureter should have the benefit of prolonged dilatation to aid in spontaneous expulsion. The only difficulty with gradual dilatation is that it sometimes takes quite a long time. A method of dilatation which I suggested to Dr. Douglass, of Toledo, Ohio, was to introduce a small piece of a sponge tent through the operating cystoscope in the lower end of the ureter and in twenty-four hours there was so much dilatation that the stone passed. Lespinasse has elaborated this method by having segmented ureteral bougies composed of small pieces of sponge tent on a wire; this when introduced into the lower end of the ureter, expands and thus dilates the ureter.

A third point I want to mention is that I am opposed to anastomosis of the ureter with the intestine in any form whatsoever. A number of years ago we made some experiments on ureterointestinal anastomosis. Dr. Brown in his paper spoke of the Coffey method and of the method of implanting the ureter into the colon. At the present time there is no known method of preventing ascending infection when the ureter is implanted in the intestine. I had six cases of exstrophy of the bladder in which the Madyl operation was performed. All these patients died. In some, the deaths were immediate. Two went along for a number of years, one I think for seven years, before renal infection caused the death of the patient.

Dr. Francis Reder, St. Louis, Missouri.—Dr. Brown stated that if the stone was located in the ureter, not to incise the ureter immediately over the stone for its removal. I have removed quite a few ureteral stones, and must say, that whenever it was my good fortune to locate the stone I took hold of it with my fingers, and holding it firmly, made the incision immediately over the stone. I have never had any untoward results in removing a stone in this manner.

I would like to know what the objections of Dr. Brown are against incising immediately over the stone.

Dr. Van Amber Brown (closing).—Dr. Miller spoke of the technic of getting rid of the ligature where you have included the ureter. I was speaking of cases where it is recognized before you

get out of the abdomen. It is probable no necrosis will occur in the ureter provided you relieve the pressure, of forceps or ligature, at the time of operation. Of course, if you find a few hours after operation such an accident has occurred that is another matter. If the kidney is comparatively clean, there will be no harm in leaving the ureter of the kidney on that side tied, because when the pressure of urine in the kidney equals the blood pressure in the kidney, secretion of all urine is stopped. You can wait as long as you wish and operate at any time, and may never have to. If there is trouble, you must relieve the pressure by freeing the ureter of the ligature or give drainage to the kidney through the pelvis of the kidney. William J. Mayo had one case in which he tied both ureters and then punctured the pelvis of each kidney, leaving drainage in place until the catgut had absorbed. The urine then flowed through the natural channels, and the opening he had made into the pelvis closed spontaneously. But if you have tied the ureter so tightly as to destroy its walls, that ureter may never functionate until you have either opened it up or until a fistula has occurred.

The technic for the elongation of the bladder I referred to is that which was described by Dr. Morris. For anastomosis one should select a fixed part of the bladder that is nearest to the ureter.

Dr. Jacobson spoke about going down into the broad ligament; that is a very nice and clever way of doing it, and the technic for ligating the ureter at that point is similar to the technic used by Dr. Bainbridge in going down through the broad ligament to locate the uterine artery when he wishes to cut off the blood supply in malignant disease of the uterus. To cut down upon the blood supply at that point is easy, but the ureters are not always easily found. Usually if they are slightly diseased, they are more easily located than normally. In cases where they are much diseased, very capable men have looked for an hour or more and did not recognize the ureters because of the condition.

The injection of oil mentioned by Dr. Jacobson is absolutely useless, and one of our best urologists recently had a patient die from infection after using oil, so it is not without danger.

What Dr. Jacobson said about transplanting the ureter into the colon I firmly believe is true.

Dr. Reder asked why we should not cut down directly over a stone in the ureter? There the power of repair is lowered because of pathological changes. The fibers of the ureter have been injured transversely and longitudinally, to such an extent that the power of healing is not good, and you can save that part of the ureter considerable repair work by going a little above the obstruction and making a longitudinal incision and milking the stone up into it. The transverse injuries of the ureter heal slowly, while longitudinal wounds heal rapidly and without stitching. As Dr. Reder has said, they will get well if you incise the ureter over the stone, but you have to keep in drainage for a longer time, and repair is much delayed compared to a longitudinal incision not over but above the stone.

ACCIDENTAL REMOVAL OF INTESTINES THROUGH THE VAGINAL VAULT.

BY

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THE following case made a great stir in the court circles of my county a couple of years ago. I relate the circumstances as I remember them, having heard both sides of the case. I am not judging the guiltiness or the innocence of the operator. My object is simply to clear up a question on which there seemed to be great difference of opinion.

A young woman, pregnant for several months, had been flowing for some time. The operator, with the assistance of the husband, who was a dentist, and a nurse, attempted to remove the fetus and secundines. The husband gave the anesthetic. The doctor removed, with a pair of forceps, what he thought were fetal intestines, and burned them up under a heater. Very soon, and before the patient was taken from the table, she died.

A very superficial autopsy was made by the operator in the presence of a deputy county physician, and the body was allowed to be interred after embalmment.

A month later the body was disinterred on the demand of the woman's family, and an autopsy then showed an empty uterus with a large rent in the left side, and all the intestines had been removed. At this autopsy, it was reported that the small intestines with the mesentery, had been removed at the spine. A good deal seemed to have been made from this assertion, and various causes were assigned to this queer condition. Among them was that the undertaker, who had closed the abdomen at the first autopsy, had removed the organs. These were the facts as they were brought to my attention.

In my earlier days it was my good fortune and privilege to make many autopsies, and I promptly made the assertion that the mesentery could not have been severed from the spine by any instrument, unless it be a very sharp knife. The question arose in my mind whether the embalming fluid, formalin, would so contract the mesentery, that it was not apparent to the casual observer. Experiments were made to clear up these points. They were not made however until the case had passed through the courts, when they could no longer influence the judge nor jury. If there were other points in the case on which a verdict was to be rendered, our investigation

was not to interfere. Scientific investigation was intended, which might clear up other cases, for there is no doubt that they are of frequent occurrence.

I have seen a case operated on the eve of my departure for the Pan-American medical meeting in Mexico City, in which 18 inches of intestines had been removed through a ruptured uterus. At that time it was remarked that the bowel, found in the vagina, was stripped from its peritoneal covering. Since then, like cases have been brought under our observation in hospital practice. They have always been fatal, so far as I can remember, unless the bowel had not been injured. In all cases the intestine was pulled out of its peritoneal covering or away from the outer edge of the mesentery. Experimentally, the following will assist to clear up the subject.

Case I.—In a fat man of about forty-five years, dying of acute alcoholism, a small incision was made in the lower part of the abdomen. The tissue was somewhat edematous. A loop of small intestine was grasped with a polypus forceps and dragged down until it came away, considerable force being necessary before it parted with the mesentery. The bowel came away at its junction with the mesentery; but left some of its peritoneal covering adhering to the same. Continued traction brought away all of the small intestine to within 5 inches of the ileocecal valve, where the peritoneal covering separated entirely, and the mucous and muscular coat continued to follow the dragging of the forceps, when finally the bowel gave way at the ileocecal valve. The sigmoid was then grasped and the bowel pulled away from its mesentery, almost immediately the whole colon was pulled out of its peritoneal covering down to the appendix and the ileocecal valve, both of which were left behind. The peritoneal covering of the colon made a complete casement. The abdomen was closed and filled with embalming fluid (formalin). In three days the abdomen was reopened and hardly any retraction of the mesentery was observable.

Case II.—Medium fat body of a man aged sixty-five years, a suicide. The small intestine was grasped through an incision in the abdomen and 50 inches were pulled away before it broke off. Continuous traction brought away the ileum down to the caput coli. Other pieces of bowel were grasped, but they broke off every 15 or 20 inches. Everywhere the mesentery of the small intestine gave way at its junction with the bowel. The sigmoid was then grasped and pulled away from its mesentery. Continuous traction broke it off at the splenic flexure. From there the muscular and mucous coats were stripped from their peritoneal covering until the bowel broke off about 4 inches from the beginning of the caput coli. Powerful forceps were now applied to the mesentery at several points; but nowhere could the mesentery be pulled away from the spine. These two experiments were made by Doctor Wm. D. Minningham in my presence. Later Doctor Minningham made the following experiment alone, and kindly reported the result to me.

Case III.—Postmortem removal of intestines through artificial perforation of uterus: Woman, white, thirty-nine years old, alcoholic, married, two children; height, 5 feet and 1 inch; weight, about 135 pounds. Cause of death, valvular disease of the heart. Menstruating at time of death. Body well developed and in fairly good state of nutrition. Experiment, sixteen hours after death. Body was kept in a cool room, but not on ice, and was well preserved; rigor mortis was marked and complete. Postmortem lividity posteriorly. No odor or discoloration from decomposition. No purging at mouth or nose. The body was placed in the dorsal position and the legs strongly flexed on the thighs and abdomen. A bivalve speculum was inserted into the vagina and the cervix pulled down and steadied. A long curved dressing forceps was thrust through the fundus of the uterus, and five unsuccessful attempts were made to pull a loop of bowel through the uterus. The failures I attributed, first, to the forceps teeth, which were good, but not of the best; and second, to the rigor mortis which had also involved the uterine muscle.

The abdomen was then opened by a small incision and the loop nearest the forceps was tied with a fine cord to the end of the forceps. The gut was easily pulled out through the vagina. The forceps was now applied to the bowel and the pulling process continued until the gut was torn away on both sides.

The primary attempts to grasp the bowel did not cause any apparent injury other than a partial stripping of the peritoneal coat. The piece of gut removed consisted entirely of small intestine and appeared very much smaller than the normal gut *in situ*. It measured 13 feet and 6 inches in length, and was flattened, rather than rounded. The average width was $\frac{5}{8}$ inch. It was practially free from gases, and contained a small quantity of a thin yellowish material. The bowel was surrounded by peritoneum over three quarters of its circumference, the remaining quarter being bare throughout its entire length. The raw area presented the muscular coat, and corresponded with the former site of the mesenteric attachment. A careful examination failed to show any mesenteric tissue attached to the bowel.

The abdomen was then examined. The subcutaneous fat measured 1 inch in thickness. The peritoneal cavity showed no leakage of intestinal contents. The remaining small intestine and colon were moderately distended with gas and fluid. Two torn ends of small intestine were rather firmly impacted into the perforated muscular wall of the uterus.

The gut on the left side was withdrawn abdominally from the uterine rent. It was found that one inch rested within the uterine muscle and cavity. This segment of bowel measured two feet from the duodenojejunal angle.

The gut on the right side was then withdrawn from the uterine rent, and it showed that two inches of its length was within the uterine muscle and cavity. This piece of bowel measured nine feet from the cecum. Except for moderate distention with gas, the large bowel showed nothing unusual. The uterus was hard,

normal in size, and not adherent. The uterine rent presented itself almost like a clean transverse cut one-half inch long at the uppermost portion of the uterus, slightly to the right of the median line.

As a result of this study and observation, the following points seemed important:

First.—That any portion of the bowel can be pulled away by traction with a forceps through a rent in the uterus or vagina.

Second.—That the point of separation will be the junction of the bowel with the mesentery.

Third.—That in some subjects the separation will be extraperitoneal in a large measure.

Fourth.—That the mesentery *cannot* be pulled away from its origin of the spine or elsewhere.

I have reported these observations because of their medico-legal value and that they may constitute a guide for others.

DISCUSSION.

Dr. G. Van Amber Brown, Detroit, Michigan.—I desire to mention a case in which I accidentally punctured the uterus during a minor operation. It has been my experience twice to puncture the uterus. I have never been unfortunate enough to curet the intestines. We are told that when we go through the uterus it is like going through wet brown paper. To those of you who have not been unfortunate enough to have this happen, I will say that it is easier than a great many suppose; it is like putting a sound or instrument into water. You apparently meet with absolutely no resistance whatever.

In this patient I was about to do a simple repair of the cervix and perineum. The family refused to have the woman sent to the hospital. They said I could have anything I wanted at the home. I had the assistance of two nurses and two doctors. This woman had been confined several times, and her last baby was four months old. I think we should have waited longer before repairing the cervix or perineum, at least six or eight months. I passed a sound and found that the uterus was about 3 inches in depth. I then began using graduated dilators, passing them in one after another carefully when, to my surprise, the dilator kept going in farther and farther. I wondered if I might have overlooked a pregnancy. The cervix was pretty well dilated, and I could feel something; I thought I had unruptured secundines. I introduced forceps and pulled down on it a little bit to investigate and it felt thicker than secundines. I left the forceps attached; pretty soon I could see the forceps move a little from the vermicular motion of the intestines. I pushed the forceps up a little being pretty sure to get beyond the fundus, and packed the uterus. Then I repaired the perineum. After thinking the matter over carefully, I came to the conclusion that if

I were to open the abdomen now the woman would probably die, and without interfering might do better. I found the woman that evening with a pulse that was beginning to get thready and rapid. The next morning when I visited her she had had a chill and was sweating; her pulse was more rapid and wiry, with definite tympany. The woman was sitting up on the eleventh day and made a good recovery.

Dr. Herman E. Hayd, Buffalo, New York.—This is an exceedingly interesting subject for us to discuss, and so far as the possibility of perforating the uterus is concerned, Dr. Brown has shown us, in this dramatic case he has cited, that it is an easy thing to do. But I think the important part of this paper is its value to the Association by reason of the experiments of one of the nestors of our profession, Dr. Ill. I would never have believed it was possible to pull all of the small bowels out and even the colon to the splenic flexure by simply taking hold of a gut and pulling it, and that it would separate from the mesentery and leave only pieces of the peritoneal coat attached to the mesentery. I think this is a very important contribution on this subject and from the standpoint of possible medicolegal complications arising in the future, is of great value to us in giving testimony.

I have never had any personal experience in dealing with one of these cases, but Dr. Mann told me of a case he had. A young practitioner in cleaning out the uterus after abortion, pushed a long placental forceps through the uterus and kept on pulling at what he thought was placental and decidual tissue, until he pulled away so much of bowel that he saw it and smelt fecal contents. He had pulled out over 12 inches of the gut in his manipulation. The woman, of course, promptly died.

Major Robert T. Morris, New York City.—When a doctor finds that he has punctured the uterus and the bowel has descended and there may be a beginning peritonitis, one extremely important step in technic is this: Get the patient's respiration down to about 12 per minute with opium (do not use morphin), and that will stop peristalsis. When the respiration is down to 12 it is an indication that peristalsis has ceased. If you can hold the respiration there for a few hours the peritonitis will probably stop right off, and you can then do any further work that you require. Too many of us have forgotten about this old-fashioned Alonza Clark method for halting an acute peritonitis, but it is very practical.

Dr. K. I. Sanes, Pittsburgh, Pennsylvania.—About eight years ago a patient was admitted to my service at the Western Pennsylvania Hospital with 9 feet of bowel hanging down through the vagina. Four hours before the admission a physician in a mining town had tried to remove placental tissue from the uterus after an abortion.

After cleansing the vagina I tied off the nine feet of bowel, closed the cut ends with circular sutures and pushed them back through the uterine tear into the abdomen. The abdomen was then opened. After the removal of about 2 inches of bowel on either side to make sure of the circulation and asepsis, I made a lateral anas-

tomosis and closed the abdomen without drainage. The woman recovered.

Dr. Ill.—What did you do with the mesentery?

Dr. Sanes.—The mesentery looked normal, it was free and did not bleed. I brought it together with sutures, being careful that the two ends of the bowel had their mesenteric attachment.

Dr. Ill.—In other words, the mesentery was still intact?

Dr. Sanes.—Yes.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Some years ago a New York surgeon came over to Jersey City and operated on a woman. The next day the woman was brought into the hospital with a knuckle of intestines coming out of the vagina. I opened the abdomen and found that forceps had perforated the mesentery of the sigmoid and the operator had pulled down a knuckle of small intestine which was moved from about the splenic flexure. I was somewhat embarrassed by this perforation of the mesentery of the sigmoid and left fornix of the uterus. I pulled out the intestine and made an anastomosis with the Murphy button above the sigmoid flexure. There was not a fringe of the mesentery of the intestine down on the gut where it was torn. To go further, curiously the fundus of the uterus had been nibbled out in repeated attempts at emptying the uterus, so that there was quite a crater. I had to free the edges of torn material, sew it up, and three years later this woman had a child.

Dr. William Seaman Bainbridge, New York.—Some twelve years ago I was called by a fellow practitioner to see a patient whom he had curetted during the afternoon of the same day. He said, "I am very anxious about this patient. I curetted her for incomplete miscarriage at four o'clock this afternoon. She is a member of a good family living on Fifth Avenue, and I have no reason to suspect anything. She has two children and was some three months' pregnant." When I saw the specimen which he presented to me I at once recognized pieces of adult small intestine. A laparotomy was done immediately. I found that 19 inches of the small bowel had been removed through the fundus of the uterus; the opening in the uterus had tightly contracted down upon the intestine so that the two open ends hung into the center of the cavity of the uterus. The operator had used a pair of large sponge (as placental) forceps and had pulled down the bowel. The mesentery was present and where the intestines had been removed, the free edge of the mesentery was as if a pair of shears had cut it away. End-to-end enterorrhaphy was performed, and the opening in the uterus sutured. The patient did well until the eleventh day when she developed pneumonia and died on the seventeenth day.

Postmortem examination of the abdomen showed nothing except the healed wound of the uterus and the end-to-end anastomosis.

My experience in teaching operative surgery on the cadaver at the Post-Graduate Medical School in New York for seven years, showed conclusively the frequency with which post-graduate students, many of them experienced surgeons, went through the uterine wall in the operation of curettage. I believe this accident more frequently occurs than is usually recognized.

THE PREVENTION OF THE RECURRENCE OF SYMPTOMS FOLLOWING OPERATIONS FOR GALL-STONES.

BY

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THE prevention of the recurrence of pain or symptoms following the operation for the relief of gall-stones is perhaps at this time the most important problem in the surgery of the gall-bladder and bile tracts. With the improvements in technic and the more accurate knowledge of the pathology of cholelithiasis, the operations on the gall-bladder and bile duct have been made safe and are among the most satisfactory operations of modern abdominal surgery. In spite of the brilliant achievements of biliary surgery, recurrences of pain following the average gall-stone operation are more frequent than is generally admitted to be the case. The attention which the question has been receiving is shown by the increased number of papers which have appeared dealing with the subject.

According to Gerster(1) in 11 per cent. of the patients in the Mt. Sinai Hospital operated during one year for biliary tract disease further operation was necessary within six months. Dr. A. Dean Bevan, in discussing Gerster's paper, thought the reason why surgery has failed to cure a large part of gall tract cases was because in many cases the stone is overlooked. In his own clinic this furnishes the great bulk of the cases of failure after operations on the gall-bladder.

Chas. H. Mayo in 1915, reported that out of 370 cases of diseases of the gall-bladder and ducts operated during four months, forty-eight (13 per cent.) of the patients had already been operated for the same condition. Deaver(2) states that about 4.07 per cent. of the cases operated at the German Hospital, Philadelphia, were secondary operations. Eisendrath, who has written extensively on this subject, classifies the causes of recurrences as follows:

1. Reformation of calculus in the gall-bladder, (*a*) due to recurrence of persistent of infection, (*b*) due to reformation of calculi in the Luschka crypts.

2. Recurrence of calculi in the common, hepatic, or intrahepatic ducts by recurrence or persistence of infection.

3. Reformation of calculus in the stump of cystic duct.
4. Reformation of calculus around silk ligatures.

Judd(3) thinks that recurrences of symptoms in biliary cases are most often due to (1) recurrence or persistence of infection; (2) reformed or overlooked calculi; (3) chronic pancreatitis.

During the past two years at the Mayo Clinic there have been 2027 operations of which 219 were secondary, 80 per cent. of the operations were for the removal of the gall-bladder; 120 of the 219 cases were for removal of gall-bladder which had been drained previously. In 109 cases of the 219, calculi were found either in the gall-bladder, ducts, or in both, fifty-nine in the gall-bladder; 9 in the gall-bladder and ducts, and in forty-one cases in the duct only. Adhesions were noted in 148; pancreatitis in forty-one cases, and fistula in thirty-seven cases.

In sixty-four of the 219 cases, both the primary and secondary operations were performed in the Mayo Clinic. From fifty-one of these cases stones were removed at the first operation, and from these stones were removed at the second operation in thirty-five (68.6 per cent.) cases. In a considerable number of these cases drainage only was done at the primary operation, and no attempt made to locate stones on account of abscesses, etc. Such cases should be classified as requiring a two-stage operation, first for drainage, and the second for removal of stone and drainage of the common duct.

The successive stages through which the technic of gall-bladder surgery has evolved, beginning with the suture of the gall-bladder to the abdominal wall, with secondary removal of stones, to the modern operations of cholecystotomy and cholecystectomy with or without the opening of the common duct, well illustrates the efforts which surgeons have made in the past to improve the permanent results following operations for gall-stones. Such secondary operations, as enumerated above, are not at all infrequent.

The classical or routine operation for gall-stones until recently has been cholecystotomy through the upper right rectus incision, an incision which, as a rule, is insufficient and inadequate for thorough work. The permanency of cure following these operations has been variously estimated.

In a study made by C. H. Mayo of 242 cases of cholecystostomy, he found that 53 per cent. were cured, 38 per cent. improved and 9 per cent. not improved. In 219 cases of cholecystectomy the percentage of cures was 71 per cent., while 22 per cent. were improved, and 7 per cent. not improved. This study shows 18 per cent. of cures in favor of cholecystectomy, while the per cent. of improve-

ments is higher than cholecystotomies by 16 per cent. W. J. Mayo is of the opinion that cholecystectomy is indicated in 80 per cent. of cases of gall-bladder disease. Swope reports 96.8 per cent. of cures following cholecystectomy, and only 74.8 per cent. of cures following cholecystostomy.

In 1914, Graff and Weinert(4) traced 124 of their cholecystectomy cases and found that only 73.4 per cent. were permanently cured, whereas Schultz, in a series of 510 cholecystectomies, was able to examine only 145 cases, and not one of these showed evidence of recurrence.

The more radical operation of cholecystectomy has increased the percentage of cures from 15 to 20 per cent.

There can hardly be any question now regarding the superiority of cholecystectomy over cholecystostomy, the former operation giving the higher percentage of cures and in experienced hands does not give an increase in mortality over the operation of cholecystostomy.

That the gall-bladder is an organ essential to life or health, or that it has a specific function, has not as yet been proved. Aschoff(5) and Ehrhardt(6) have shown that after simple drainage infection may recur, because it persists within the structures known as Luschka's crypts. Calculi may form in these crypts and be expelled into the lumen of the duct to act as nuclei for larger calculi, and may explain the presence of calculi at second operations.

The inflammation of the gall-bladder with infection of the glands and crypts of its mucous membrane, together with the peculiar spiral arrangement of the mucosa in the small calibered cystic duct, all contribute to make a retention cyst of the gall-bladder after a cholecystostomy has been performed. Biliary colic is primarily due to increased intracystic or intraductal pressure, an increase of tension in such a previously drained crippled gall-bladder with recurrence of symptoms and with reformation of stones, can be readily understood. Reformation of gall-stones is often due to this cause. In view of these facts there can hardly be any argument for the conservation of the gall-bladder. Cholecystectomy, whenever possible, should be the operation of choice. Recurrences from other causes have been given, but for the most part the entire matter can be summed up under the head of incomplete operation, *i.e.*, incomplete removal of the gall-bladder or leaving behind stones in the cystic, hepatic, or common ducts.

In general, it may be said that incomplete operations are the result of inadequate exposure of the field of operation. Patients

suffering from gall-stone disease are, as a rule, obese, and it is therefore necessary that an incision be made which will allow the gall-bladder and ducts to be brought well up into the incision so that they cannot only be palpated, but inspected as well.

The technic which the writer has found of value in making operations upon the gall-bladder and ducts thorough and complete is as follows. Regarding the anesthetic, it is absolutely necessary to have the patient thoroughly relaxed, with no rigidity of the abdominal walls, during the operation. In my experience ether has proved most efficacious, while gas and nitrous oxide anesthesia has not been found satisfactory for the deeper exploration and work upon the ducts. The position of the patient, with the lower part of the thorax well elevated, the so-called Mayo-Robinson position, is also of the greatest importance.

Numerous incisions have been advocated for gall-bladder surgery. Almost every conceivable incision, extending in all directions in the right hypochondriac and epigastric regions has been advocated. The one which I employ and which has been most useful to me is the modified Bevan incision, the so-called Kehr incision. The incision begins just to the right of the ensiform cartilage and extends outward and downward over to the upper part of the rectus muscle, where it is carried vertically downward. The incision divides the external oblique fascia and anterior sheath of the rectus muscle, one-half of the rectus only being divided above. The vertical portion of the incision extends through the rectus muscle paralleling its fibers. As soon as the abdomen is opened, the suspensory ligament of the liver is separated and divided between two clamps; adhesions of gall-bladder are now separated and with the suspensory ligament as a tractor in one hand, the liver and gall-bladder are gently lifted upward. After the gall-bladder and ducts have been freed from all abnormal attachments, the junction of the cystic and common duct is freed of its peritoneum for a short distance. The degree of dilatation of the common duct is then noted and the duct thoroughly palpated.

There has been much written upon the method of the removal of the gall-bladder, some prefer to begin its removal at the cystic duct, and others at the fundus of the gall-bladder. My own choice is to begin the removal at the fundus and to detach the organ as rapidly as possible from its bed on the liver. While there is some hemorrhage during this procedure, it is, as a rule, not profuse, and is readily controlled by a gauze pack. As soon as the gall-bladder is detached the cystic artery is grasped and ligated and the cystic duct thor-

oughly freed of peritoneum. At this stage in the operation in many instances the liver can be replaced in the abdomen and the gall-bladder serves as an excellent tractor for the subsequent work upon the common duct if that should be necessary. It also greatly facilitates the accurate removal of the cystic duct so as not to injure the common duct, an accident which is not at all infrequent. Just when the common duct should be opened up in the absence of palpable stones is still a vital question. Eisendrath(7) mentions that Kehr, Bruning, and others as well as himself, have found that in about 20 per cent. of cases of common duct calculi symptoms of jaundice, chills, fever, and acholic stools are absent, these symptoms have always been regarded as absolutely pathognomonic of calculi. Calculi lying in the rectal, duodenal, and intrahepatic parts of the common duct are very difficult to palpate because one must feel them through the intestinal wall of the duodenum and the substance of the pancreas. They are very frequently not to be palpated. There is possibility of calculus in the common ducts.

1. When many calculi are in the gall bladder:

   a. When common duct is thick walled;
   b. When common duct is dilated;
   c. When there are symptoms of cholangitis;
   d. When the pancreas is hard and indurated, even though palpation of the common duct is negative.

My own practice has been to open the common duct whenever it appears to be dilated, regardless of whether stones are palpable or not. In this manner I have removed small calculi which have lodged in the ampulla of Vater and which could not be palpated before the duct was opened. Should the opening of the duct be necessary, the ducts are thoroughly explored by a probe and the stones which may be present are removed by a small gall-stone scoop. If the opening at the ampulla of Vater shows any constriction, it is my custom to pass a sound or solid gum elastic urethral bougies until the duct is dilated. The gall-bladder is removed after the work on the ducts has been completed, having served during the entire explanation as an efficient tractor.

The two most frequent sites in which gall-stones are found in secondary operations are in the cystic duct and at the lower end of the common duct. Should the common duct have been opened it is drained with an ordinary rubber tube. I have discarded the use of the T. drainage tube as being dangerous and unnecessary. In removing the T. tube from the common duct there is a likelihood of the separation of the tube at the vulcanized junction, allowing a portion of it to remain in the duct; this has happened once in my experience.

When cholecystectomy only has been performed, the cystic duct

is securely ligated with two, and possibly three, sutures of No. 2 chromic catgut. Drainage should always be provided for, as in a small percentage of these cases the stump of the cystic duct will open up and allow the escape of bile. The incision is closed in the usual manner after the suture of the suspensory ligament. In very obese persons the incision often is from 8 to 10 inches long. Hernia does not follow such incisions any more frequently than after the shorter ones. The appendix is usually removed before the work of opening the gall-bladder and duct is begun, and then only if the cecum is freely movable and the appendix is easily drawn up into the upper incision. In case of adherent cecum and appendix, it is better to make a small incision over the appendix and remove it than to injure the intestine by forcibly bringing it up into the incision.

It is the writer's conviction that the results following gall-stone operations can only be improved by the adoption of some technic similar to the one described—a technic which permits free access and exploration of the entire upper right side of the abdominal cavity.

CONCLUSIONS.

1. Recurrence of symptoms following gall-stone operations are more frequent than is generally supposed to be the case.

2. Reformation of stones after cholecystotomy occurs from retention of infected contents, rather than from leaving gall-stones behind at the primary operation.

3. Routine gall-stone operations should be made more thorough and complete by the use of adequate incisions, by cholecystectomy, and by accurate exploration of the ducts.

4. When the common duct shows marked dilatation it should be opened and explored and special attention should be given to the terminal portion of the duct for the detection of calculi and constrictions.

5. The detached gall-bladder from its bed on the liver, acts as an efficient tractor, and greatly aids in making the exploration of the ducts complete.

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DISCUSSION.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I have for a long time opposed cholecystectomy, and at this time under the strain of prevalent practice we have all of us reason to revise our attitude in this regard. It seems to me, that speaking from an etiological standpoint, we are not yet clear when a case comes to us with a manifest cholecystitis, whether we should go after the secondary condition or what is back of it. We do not consider the full effect when we simply slit the gall-bladder and drain it or remove it. The good effects from cholecystectomy come largely when we release the peritoneal plications that are irregular, and that are, in a measure, etiologic in bringing about this condition of affairs. It is an infection, but why an infection there? There is a vulnerability for infection, and we know it does exist. It is in the peritoneal plications that we have trouble. These are the causes in many instances. Let us first investigate to what extent the duodenum is angulated, disturbed, sacculated or constricted, and to what extent is the cecum and ascending colon normal. I have watched this thing for twenty years and more and have seen a number of cases with gross malformations of the cecum, ascending colon and the duodenum, with displacements of the kidneys and other organs including the pancreas. Once we can have a clear view of this matter, we will not sacrifice the gall-bladder as frequently as we are doing now. We still have reason to believe that there is some function for the gall-bladder. Dr. Jacobson says that there is no known reason for having it, yet for the present we must still regard our knowledge of gall-bladder and liver function as being rather vague. We know more about the kidneys because we can examine the secretion of the kidney. We know very little about the secretion of the pancreas and liver because we have no direct access to the same.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—There are several places in the body where we have a weakness or point of lessened resistance. Right below the cecoappendix junction and around the gall-bladder we are apt to have less resistance to microbic invasion. Microbes may go through these places into the blood or lymph stream, they get into the gall-bladder, they may ascend from the cecoappendicular regions through the lymph stream and reach the gall ducts and gall-bladder according to some investigators.

I had a case not long ago where we studied the bacterial flora of the bowel and found the gonococcus and only the gonococcus; then we took a smear from the young lady's vagina and found plenty of gonococci in there. We know from Rosenow's experiments that you can get them from the teeth; you can get them from the tonsil to the gall-bladder.

I was much impressed with a statement Dr. Morris made in New York City years ago at a time when we wanted to operate for gall-stones. At that time we did not know as much about the subject as we do to-day. Gall-stones, he pointed out, are only incidental, and if we operate for them we will not be doing work of a truly scientific and surgical character. We should operate for the infective condition of the gall-bladder or the gall ducts, and whether we

drain or remove the gall-bladder, or whatever we do, it should be for the one purpose of curing the pyogenic or bacillary condition of the bile tract. If in any operation, with a keen recollection of the history of the case you are operating on, you come to the conclusion that there must be germs actively existing in the gall duct, drain it, and do not be in a hurry to stop drainage. If a case should extend over a month or two months, do not feel that you have got to go for the gall-stone or hunt for stones, and do not forget you may have a bacillary condition active up through the gall ducts which may not admit of immediate demonstration but which the history will finally demonstrate clearly.

Major J. Henry Carstens, Detroit, Michigan.—These conditions are very largely constitutional. A number of years ago I operated on a woman who had gall-stones and removed three or four hundred of them. I explored the gall-bladder; I carefully examined the ducts, and I found no further gall-stones. I did the ordinary operation and put in a drainage tube. In a few days thereafter there were gall-stones coming out of that drainage tube. I could not understand why I was leaving such large stones behind and I said to myself I ought to have been able to feel these; that we might have little ones pass through the drainage tube, but these were big ones, and they kept on coming and coming, and I finally took out the drainage tube and they kept on coming, and I think about every week that woman brought me about an ounce bottle full of gall-stones, and she kept on passing them for three or four months. She had I think a malignant condition. She finally died. I would not say that she passed a quart of gall-stones in the next three or four months, but I am sure she passed a pint. If gall-stones will form again after an operation, when you think you have removed them all, it seems to me that there is really no use in removing the gall-bladder unless it is absolutely diseased and gangrenous, because if that patient is one of those whose constitution will develop gall-stones, she will form some of the gall-stones in the ducts and probably will need another operation anyhow, whether you remove the gall-bladder or not. Her blood is full of cholesterol.

I have had a great many of these cases examined bacteriologically; in fact, I nearly have every one of them examined, and in many instances we can find nothing in the bile or in the gall-bladder in the way of microörganisms unless it is an acute case.

Recently physiologists have found that certain individuals seem to have a great deal of cholesterol in the blood, and if they have that condition they are more liable to the formation of gall-stones. Then we ought to try and find out the nature of the microörganism, and I think we can develop antibodies and prevent the formation of gall-stones in the future in a great many of these cases. In other words, these patients ought to be treated constitutionally after operation and by so doing we will prevent a great many recurrences.

Another point: Some of these patients after a while have trouble and pain, not on account of gall-stones or the reformation of gall-

stones, but on account of injury done to the parts and the adhesions that are formed as a result of the operation.

Dr. E. Gustav Zinke, Cincinnati, Ohio.—I have never seen a return of gall-stones in any case I have operated upon. But two years ago I opened the gall-bladder in a woman who presented a typical picture of gall-stones. The gall-bladder was enormously enlarged and filled with straw-colored, almost transparent, bile; but no stones could be found or felt after a most careful search. The patient was promptly relieved. However, the opening did not close, and she returned a year later, when we operated again, and found a stone in the gall-bladder the size of a pigeon's egg. It has been a question in my mind whether this stone could have formed within one year, or whether the case may not have been one in which the stones are hidden in the biliary passages within the liver substance and subsequently find their way into the gall-bladder. This one case well illustrates that a great deal of pain may be produced by a distended gall-bladder alone, while a gall-bladder enormously distended with stones may produce no symptoms at all. To illustrate:

Sometime ago I operated for procidentia, performing a perineorrhaphy, and a posterior, as well as an anterior colporrhaphy. I then opened the abdomen, and did a supravaginal hysterectomy, removing both ovaries and tubes at the same time. When I was about to close the abdomen, the patient's doctor said to me, "I wish you would examine the gall-bladder. This woman I think, had a gall-stone attack about three years ago, and I have always suspected she had gall-stones." I put my hand into the abdomen and found a gall-bladder larger than my fist. Temporarily covering the median incision with sterile gauze, I made another opening over the gall-bladder, brought the viscus into this incision and removed 1883 stones, filling a 6-ounce bottle. This woman had had no symptoms of gall-bladder trouble for several years prior to the operation. She came to me seeking relief for the procidentia only.

Dr. Goldspohn.—Was there any stomach disorder?

Dr. Zinke.—No. She seemed to be in perfect health, except for the procidentia, and made a splendid recovery, notwithstanding her being on the operating table nearly three and a half hours.

Dr. Jacobson (closing).—With regard to Dr. Zinke's symptomless gall-stone cases, I do not think there is such a thing as symptomless gall-stones. We have had a large number of such cases as Dr. Zinke has reported where there were no outstanding symptoms of gall-stone attacks in the history, but in every case of this kind, if you go back and question the patient closely, you will find atypical symptoms of gall-bladder disease. We have come to the conclusion that symptomless gall-stones do not exist.

The question of cholecystectomy and cholecystostomy is interesting. Relative to the removal of the gall-bladder, the fact remains that the curves have been increased 16 to 20 per cent. after cholecystectomy. Regarding the function of the gall-bladder, I would emphasize the fact that a function for that organ has not as yet been proved.

OPERATIONS FOR STIGMATA OF DECLINE.

BY

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All of the Aryan nations at the present time appear to be declining. No one knows what group will next become dominant. In the course of decline of any cultivated variety of animal or plant nature appears to strike at the reproductive organs of the female. After cultural limitations have been reached various stigmata of decline to be observed on physical examination are to be found in man and a paper covering the entire subject would extend into volumes. I shall speak about a few of the stigmata appearing in women which interest the surgeon.

Deformities of the pelvis have formerly received more surgical attention than they do at the present time when Cesarean section is performed with such high degree of safety to mother and child. The operation of symphysiotomy for the relief of one of the stigmata, has practically passed out of the field and about the only operation for bony stigmata now consists in breaking a deformed coccyx which may stand in the way of the free delivery of a child. Even this procedure is a rare occurrence.

Stigmata belonging to arrested development of the ovaries find expression at times in the development of neoplasms which do not belong to well-developed normal ovaries in mammals. The oviducts are sometimes undeveloped and where we have that form of obliteration of the lumen known as fibronodosum, surgery may sometimes be employed effectively rendering an otherwise sterile woman fertile. The operation which I have done consists in bending such an oviduct upon itself and making a slit in the ampulla and a slit in the cornu of the uterus, guided by a sound in the uterus held by an assistant. The margins of the two slits are sutured together in such a way that a lumen into the uterus is produced and the ovum may find its way to the endometrium by this short-circuit route.

Flexions of the uterus are most often symptomatic and representing one phase of a general condition but occasional stigmata may be

dependent upon arrested development of some part of the uterine wall. In our surgical work it is extremely important to distinguish between these two kinds of flexions because the symptomatic ones do not call for surgery, notwithstanding the fact that they have received such a high degree of operative attention on the part of gynecologists in former years.

The appendix vermiformis often appears in the form of a stigma of decline when it undergoes fibroid degeneration before middle life of the patient. This vestigial structure is prone to undergo fibroid degeneration in very normal people, but an early change representing stigma of decline commonly belongs with patients who present other stigmata like narrow costal angles, gun-stock scapulæ, high arched palate, or defective ears. This group includes neuropathics very largely. A great many operations have been done for the removal of a fibroid appendix which was practically harmless excepting for a moderate degree of local irritation, in cases in which a surgeon ran into a trap by thinking that he was decapitating the demon of all of the patient's ills. The removal of a fibroid appendix in a case of this sort is commonly followed by a temporary improvement in health of marked degree because of the effect of suggestion which is extremely potent in this class of patients. At the end of a year or so the other features again come into evidence and the patient is found not to have been benefited very much by the operative work.

In almost all of the operative work done for stigmata of decline we shall find that the patient ought to be informed in advance that we are relieving simply one phase of a general condition. This is particularly true in cases in which we fix loose kidneys. Loose kidneys commonly belong among the stigmata where we have a dragging colon and shallow Gerota's pouch. In well-selected cases in which loose kidney has brought about a train of disturbing symptoms peculiarly its own, very brilliant results sometimes follow a fixation operation properly performed, but we must nevertheless remember that loose kidney as a stigma commonly does not require operation at all. The patient may even be harmed. It is all a question of good judgment of the sort which we are supposed to apply in every case without regard to argument for or against the desirability of any given procedure. Loose peritoneal supports and the prolapsed colon commonly belong to the stigma category. Sometimes the secondary complications call for surgical work in these cases, but we must always remember that the patient has something else the matter—something belonging to arrested development. Indiscrimi-

nate operating merely upon a basis of the objective signs will bring surgery into disrepute unless we clearly obtain a comprehensive view of the case as a whole.

DISCUSSION.

Major J. Henry Carstens, Detroit, Michigan.—I do not know whether the Aryan race is declining or not. I have my doubts about it. I likewise have my doubts of these things being stigmata of decline. I think the process is a great deal slower than that. I do not think these stigmata of decline come all at once, say within the last twenty-five or thirty years, where for ages and ages the human being has been strong and powerful. I can see how we can have defects in individuals as the result of change or mode of living, and I can see how in the last thirty or forty years a large number of people having changed from a farming community to a city community, or from a farming community, where they lived out in the fresh air, had plenty of oxygen, and where their life was simple and food simple, have become stronger, and I can see how people that live in the city, closely housed, living on poor food, or sometimes with very rich food, and with little physical exercise, and eating a great deal of candy and sugar, ice cream and such things, may upset their systems in all kinds of ways.

As to the imperfectly developed uterus or any other organ, I can see how that can occur by some weakness or some missing ion in the spermatozoa or in the ovule out of the millions and millions of ions that make up the human body in the course of time, but we have that same lack and poor development in the child who is born with a harelip, with a club-foot or anything else. You would not say that is a stigma of decline because a child is born with a club-foot. There is some defect in development. It may be due to intrauterine pressure, or it may be caused by a slip in some of these millions of ions in the spermatozoa or in the ovule.

Coming to the treatment of such cases, I would not say that we cannot do very much for them because we can help some of them very materially. Let us take the poorly developed uterus which is muscle and we can make it as large as the normal uterus and as strong, as I have shown repeatedly, with the stem pessary. You can develop the uterus as a muscular organ the same as you can develop the muscle of a blacksmith or any other individual.

As to the other conditions that Dr. Morris talks about, such as general abdominal ptosis, I will admit the appendix is a declining organ and gradually shriveling up and causing more or less trouble; but the general abdominal ptoses and the loose and floating kidneys, and so on, are based a great deal on that lack of coöperation of the endocrine glands, and these again are due to a poor or imperfect mode of living, so that I think if we pay more attention to the mode of living and the question of the endocrine glands of the body, a great many of the so-called stigmata of decline will disappear.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—What constitutes the decline of species must be considered before we will come to any intelligent reasoning about this matter. What have we done to say that certain species have declined? A suggestion offered by an English investigator recently is *a propos* in this connection. In the swampy regions of Brazil and elsewhere he collected skeletons of old species that no longer existed, and he pondered over the findings to see if they had not come to their death by microbes in these swampy regions. A German investigator took up a similar line of thought coincidentally and pondered on the reasons assigned by historians and came to the conclusion that the Greek was not conquered and in that way explained his position or perspective as indicated by the suggestion of Dr. Morris that the present war may have something to do with the Aryan races going down.

Malaria has been considered a productive cause in bringing down that people. They had no quinin in those days, so that the mosquitoes worked assiduously and successfully, so that the matter of decline of species is still a mooted question. We cannot as yet definitely say we are going down. When we meet with babies at their entrance into the world they are flat chested, but afterward they are not. The average baby has a wonderfully nice development of chest and the promise of good development, and yet during the second year certain diseases will so vitiate and interfere with nutrition and the formative conditions of the system that we have enteroptoses and collateral high arches. During the formative stage bone disease comes in to prevent the development of the skeleton.

I think a pessimistic view of these things at this time is hardly justifiable, and further, I believe we will not relieve these conditions on the ground of any pessimistic view we may take, and for practical reasons it should not be entertained.

Dr. James E. Davis, Detroit, Michigan.—I am inclined to view this matter very much as Dr. Carstens has stated it. We must remember that function determines anatomic form. If we look at the entire anatomic structure as included in all animate creation, we see there the evidence of an evolution of form, and we look for very much greater differences in different animals. For instance, we would think that the pig and man ought to vary much more widely than they do; but if we study the organs of the pig and the organs of man, we will be very much surprised to find almost the exact anatomic and physiological correlation in the organs of these two species. There are so many intervening factors modifying conditions that we must expect a very great variety of form, a condition in which one organ is no longer necessary in the one animal and very necessary in the other.

When we consider man we have a greater problem to deal with. Man, of all animal creation, is perhaps the only one that does not mate in a natural way. He has a way of interposing certain factors which in my mind have much to do with changing the form of different parts of the body. Eugenic marriages, I believe, would make

great modifications in the human anatomy. The fancy stock breeder at will varies form and function of his stock. We do not do that. All the efforts that have been put forth in this direction have failed. Perhaps only partial success is ever obtained by any effort in this direction. It does seem if this was practised to the extent that the fancy stock breeder carries this idea, we would see a great many of these conditions that Dr. Morris speaks of corrected to a degree commensurate with the function demanded. Burbank has beautifully illustrated just what can be done by the selection of species and breeding from the particular selections that he makes, attaining just that thing he wishes to accomplish.

Dr. Goldspohn.—It appears to me, that the dogma of imperfect development could hardly be strictly called a decline but rather an infirmity.

Major Morris (closing).—Dr. Carstens believes that a good deal of the decline in our species is due to people going from healthful surroundings in the country to city life. A great many farmers, however, keep their windows closed too much and, as a matter of fact, farmers have not learned how to live well in this country as yet. The surroundings of the average farm are about as unhygienic as those of the city. Men will work out in the woods chopping wood and get up a tremendous oxidation all day long, and then go into the house where the wife has had the windows all closed and shut tight all day, where there is washing done, where there is very little oxygen, and he spends the night there. After being out in the open chopping wood he sleeps in a house with closed windows, which results in degenerative changes in the individual. The slow form of change which takes place in manifesting itself among the Aryans in a decreasing birth-rate. Several authors have published statistics showing the decreased birth-rate in the Aryan group of nations. The same things occur among the plants and animals when they reach cultural limitations.

Dr. Carstens spoke of harelip and club-foot, and for the moment I do not know if club-foot represents a stigmata of decline or not, but harelip certainly does. Endocrine changes do take place in the individual as a result of the mode of living. The children's muscles and bones and all structures will be developed, but because of habits of life of the Aryans, particularly under the conditions of civilization, they are declining faster than they should.

Dr. Davis said that function determines anatomic form, but then you have a sort of converse of that proposition. Where you have undeveloped anatomic form you have a decrease of function or perverted function so that we are dealing all the while with the same category. A great variety of forms shown in individuals depends upon the law of variation which is always at work with all organic forms. The law of variation goes with the stigmata of decline, and some of those stigmata I spoke of are the ones that interest us as surgeons, and some of the stigmata are operated upon in a futile way under the impression that by correction of a stigma we are going to change the rest of that individual's anatomy. The stock

breeder varies stock at will, but when he gets to a certain point the stock stops breeding because there are cultural limitations.

Dr. Goldspohn asked about imperfect development as representing infirmity only. We are using different words for the same thing but infirmity being physical in its nature may be classed as a stigma and they are interchangeable terms.

Dr. Goldspohn.—Why not say premature decline?

Major Morris.—Yes, what I might call variant decline. People with the features that I brought forward are the ones who represent variations in decline and they present infirmities.

SUCCESS AFTER FIFTY.

BY

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Detroit, Mich.

THE idea of reading a short paper before this body upon the subject of "Success After Fifty" came to me, when, at our last meeting, one of our Fellows remarked that if a man was not heard of before forty, he would not be after that age had been attained. In the past we have too long been influenced by the worn-out tradition that men should become static at forty or thereabouts. No one accepts that statement in a sitting posture now. I believe that it is not impossible, no, not even exceptional for a man, unrecognized up to the age of fifty to bring forth his greatest work after that time.

For the purpose of this paper, let us use the following definition of success—it is, I think, success in a broad and conservative sense. I am taking it to mean leadership in any line of human activity—art, science, literature, business, invention, adventure—the production of anything acknowledged to be of permanent and marked value to humanity.

Of course, it is not to be supposed that a man can sleep until he is fifty, and then suddenly blossom into greatness. Old age is built upon the foundation laid by youth. If a man has lived cleanly and strongly and purposefully up to middle age there is no reason, scientific or otherwise, why his later years should not be crowned, not only with his measure of success, but also with the fame, the glory for which all men hunger.

There is a tendency in the present generation to rebel against the unwholesome idea, expressed, though in jest, by Dr. William Osler, when he remarked that "men of forty should be laid on the shelf, and those of sixty, chloroformed." The fact that Osler himself is now, though past seventy, engaged in some of the finest work of his life at Oxford University is sufficient evidence that he, at least, did not allow an outgrown tradition to limit his activity.

It is only half a generation since men were considered old at forty. Among primitive people the idea is still prevalent, but wherever ignorance and superstition shrink back into the corners where the light of the lamp of science never penetrates, men are coming to

realize that the fact that when the milestone of fifty is passed, it need deter no one from feeling as keenly as ever the fires of ambition. Women especially are becoming virile with years in this age.

Science has revealed to us the value of prolonged infancy in the development of any organism. Ultimate power and capacity are in direct proportion to the length of the period of infancy, of preparation. Epictetus expresses this principle, and the purpose of infancy, figuratively, when he says, "First study to conceal what thou art; seek wisdom a little while unto thyself. Thus grows the fruit; first the seed must be buried in the earth for a little space; *there it must be hid and slowly grow* that it may reach maturity. But if it produces the ear before the jointed stalk, it is imperfect—a thing from the Garden of Adonis."

It is the belief of philosophers and psychologists that the difference between the mental adaptability and capacity of the lower animals and that of man is due to the increased length of the period of dependence and the relatively slow development in man. The power of adjustment to environment, the ability to think—in fact, all of the higher faculties are developed during infancy. Now, the end of the period is placed, by modern psychologists, at thirty years. Are we to believe that twenty years later that mind, developed so slowly, so gradually, with such infinite effort and expense of energy has reached a state of degeneration and decay? That life, as a growing, achieving, advancing force has ceased—only twenty years after it has reached maturity?

Is there no hope that the man who is at fifty an apparent failure, or a nonentity is to succeed? No assurance that the man, successful in a measure only, may reach the high pinnacle of leadership in whatever work he has chosen for his own? I believe that there is hope, and abundant hope after fifty, for a man to exceed his former achievements—no matter how trivial or how far-reaching those achievements have been.

There are countless instances, in all ages, to confirm me in my belief, but I can, of course, here cite only a few rather striking ones to indicate the prevalence of such cases.

First, I shall mention a few men in our own profession who have risen from obscurity or mediocrity late in life, and attained success with years.

Guy de Chauliac, the most distinguished authority on surgery during the fourteenth and fifteenth centuries, was a country boy from Anvergne. He managed through friends to get a medical education at Trelouse, Montpelier, and Paris. More than 500 years

ago, he advocated cutting out cancer with the knife, at an early stage, but employed the actual cautery in the fungous variety as it carries anthrax and similar lesions. His great contribution to surgical literature, "Chirurgia Magna," was written when he was sixty-three years of age.

Thos. Willis, Sadleian professor of philosophy at Oxford, moved to London in 1666, at the age of forty-six. Here, though no longer a young man, he acquired the largest fashionable practice of the day; and gave the first description of the eleventh cranial, spinal accessory, also of the hexagonal network of arteries at the base of the brain, now called by his name.

Thos. Sydenham, when in his fifties, gave the first description of the articular and muscular pains of dysentery, and gave a full account of scarlatina, a disease hitherto unidentified and confused with measles. At the age of sixty-one years, he gave to the profession his masterpiece, a treatise on gout.

Edward Jenner, in 1798, the fiftieth year of his life, published his work, "An Inquiry into the Causes and Effects of Variolæ Vaccinæ."

Sir Chas. Bell, the leading British anatomist of his time, located in London in 1804. He lived there during thirty-two years, never acquiring the practice he hoped for; but at sixty-two years, accepted the chair of surgery at Edinburgh; at fifty-two he had acquired a clear understanding of the difference between sensory and motor nerves. Three years later he demonstrated that the fifth cranial nerve (Bell's nerve) is sensory motor, and so also that the seventh nerve of the face is motor, a lesion of which causes facial paralysis (Bell's palsy).

Sir Samuel Willis of Cumberland, England, wrote his charming and widely read "Biographical Reminiscences" in his eighty-seventh year.

Now let us turn from medical men to those in other pursuits. It may be observed that only men recognized as being at the head of their respective arts or professions are mentioned.

One of the most interesting is Cato, who at eighty determined to learn Greek and mastered it so that he used both the spoken and written language easily.

Theophiastus at ninety began the "Characters of Men" whose fame has brought the writer's name down to the present day. Sophocles wrote his grand "Oedipus" when past eighty, Siminodes took the prize of verse from his compeers at a like age. Socrates himself, not content with a life passed in intellectual effort and

wonderful achievement as a thinker and teacher, at eighty determined to play the lyre and became an accomplished performer upon the instrument.

At sixty, Chaucer, the so-called "father of English literature," wrote his incomparable "Canterbury Tales"—a work which exceeded all his others in literary value, and which has scarcely been equaled in English literature since that time.

Goethe, toiling till the end of his life in the writing of "Faust," finished it only when he was eighty.

Many of the names most familiar to us, because of the distinction won by their owners in our own day, belong in this category.

Thos. A. Edison, though famous long before middle age is now, though advanced in years, making the last the most productive part of his active life.

Henry Ford at forty was poverty stricken, unknown either in the world of finance or invention. To-day at fifty-three, he is many times a millionaire, and as an inventor his name is known wherever an automobile is known.

J. B. Ford, to whom the Ford Building of this city is a monument, until past sixty years was in poverty and considered a failure. Afterward founder of the Pittsburg Plate Glass Company he was the first man in the world to make plate glass. At the age of seventy-three years he was again without funds, when he borrowed money with which to finance the Michigan Alkali Company, of which he is founder. At ninety-two years, conducting his business affairs to within a half hour of his death. He died a multi-millionaire.

Peary's remarkable and thrilling journey to the north pole was made when he was about fifty, and its acknowledgment by Congress and all the scientific societies of the world made him at once one of the most successful men of his generation—a leader in exploration.

Much of the brilliance of the literary world of to-day is due to the names of men who lived in obscurity to middle life, when they "woke and found themselves famous." Many others have won for themselves a niche in the hall of fame, where their earlier work could never have placed them.

George Bernard Shaw, cleverest of satirists, has produced some of his most scintillating comedies since fifty. Ibsen, the revolutionist of modern drama, and Bjonnsen, another Scandinavian dramatist of no slight fame, have produced some of their most masterly dramas at an age we carelessly call old.

Though Walt Whitman wrote "Leaves of Grass" in his thirties, he was not recognized as great till far past fifty.

Our greatest naturalist, beloved and fascinating writer, John Burroughs, has recently completed and published his masterpiece on wood lore. He is, as you all know, a man past three score years, but one whose energy and interest in the work of nature shows no sign of age or feebleness.

John Muir has made his name an authority in scientific circles by his research in the study of glaciers, since the age of fifty.

Wm. de Morgan, author of "Joseph Vance," "Alice for Short," "Somehow Good," and other novels of recognized quality, is the example *par excellence* of the man in advanced middle age who invaded a new field of art and broke all records for belated achievement in fiction. Until he was sixty he had written nothing—he is recognized as the foremost novelist of the present era.

Perhaps it is appropriate to mention here two women of northern Europe—both well past middle age and both in the public eye of late. I speak of Ellen Key, who now at sixty-two is doing her best work, Norwegian, author and philosopher, and Breshkovskaya, the "grandmother of the Russian revolution," who achieved her greatest power of inspiration in old age. At seventy-five she is one of the leading spirits of Russia.

In the present crisis we have in President Wilson a supreme example of the very thing we are discussing. Who of us knew Woodrow Wilson ten years ago; now the eyes of nations are upon him.

> "For us, down-beaten by the storms of fate,
> One man, by wise delays restored the State,
> Praise or dispraise moved not his constant mood,
> True to his purpose, to his country's good;
> Down ever lengthening avenues of fame
> Thus shines and shall shine still his glorious name."

And so one could go on and on, mentioning such as Gen. Pershing and Marshal Foch, giving not a few but literally hundreds of names, familiar to us all because of the glory of the lives they represent. The list of men who have met, or better who have made success after fifty is continuing to lengthen—and will continue to lengthen faster in this generation, I believe, than ever before. For the tendency of to-day is toward open mindedness, toward a desire to think broadly and freshly. With the astounding results of invention constantly being revealed to us, the accomplishment of the impossible, the conquering of inconquerable forces, we have come naturally to believe that what has not been can be.

I appeal to you, my hearers, for belief in yourselves. We need not turn to historical has-beens for inspiration, but to the future

within us, and in which we thoroughly believe. These sketches I have read merely show "how far the gulf-stream of our youth may flow into the arctic region of our lives."

How well did our revered fellow Dr. John Henry Carstens set forth the right mental attitude this year in our Michigan State Medical meeting when, after fifteen years of fighting on one side of a certain question, he saw that he was wrong. He rose promptly and said to the assembled gentlemen, "I believe that the speaker is right. He has improved the technic and has a good thing. I am convinced, and if I ever live to be such a darned old fossil that I can't get a new idea into my head, I want someone to take me out and kill me."

My dear fellows, that is the spirit that leads to success at any age. It is that spirit that makes E. Gustav Zinke the most efficient man to-day for the office he holds in this society.

The man of fifty need not be deterred from continued hope of satisfying ambition, neither by success nor failure. "In success, failure is but an incident." Knowledge of past failure may be an asset in that it may be a spur to future effort. Knowledge of past success a stimulant to greater worth. Renewed effort, strong with determination should follow success as well as failure. Life was made for activity and by activity alone does the mind gain in scope and delicacy. Age matters not, it is the working habits of the brain upon which success depends.

As long as the mind forms and welcomes new ideas, as long as it is pliant, power and potentiality are still alive. When it becomes fixed, that is the tragedy. That is the sign of decay, no matter at what time of life it becomes habitual. To live much rather than long is the purpose of existence.

It is our own fault if our lives narrow down to limitations and our hopes to petty confines. Suppose there never had been up to this day one man who attained or augmented success after middle age. That fact could not prove the possibility negative. It depends upon ourselves alone whether we go year after year in paths that lead only to deeper, bigger things, or whether we allow our rosary to become a sad chain of disappointments.

The weaknesses usually attributed to old age are faults of character not of the time of life. In each of our lives there is something especially seasonable.

No one knows when he has reached the crisis of his life's affairs, any moment may bring the crossroads with the finger pointing to success in full view.

DISCUSSION.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Away back between the second and third glacial periods I believe we have remnants of five different types of men. Four of them were strong and vigorous of muscle and big boned, with every evidence of being able to fight for the future, but they have gone. But one tribe had slender bones and evidences of not such strength of muscle. There was that which seemed to indicate they were more agricultural than animal features. One would judge from a study of the skeletons that they would not amount to much, but it is from them that we get evidences of their versatility. The success which comes to us, that which has the most influence, that which is going to enable us to live on and develop and propagate is our versatility.

If you will look over the races of the world and study them and study the American form, and perhaps the American form is condensed in the Puritanical type, I wonder if you will find very many stigmata or defects. I wonder if you go back to the different people who are not so highly civilized (and civilization is a disease itself), if you will find all these stigmata which are spoken of as being evidences of degeneration of the human race. Is it not a fact that in this community and in those centers where researches and observations are made and books written, the biggest part of the world we cannot see thoroughly.

Precocity is a sign of inferiority. If we are precocious mentally, we degenerate mentally early. The man who comes to his own in his mind later in life is the man who holds his mind longer in life.

The medical man began away back. The Samarians came down out of the mountains and fought the Aryans. That is the first we have so far as history is able to reach, and the word doctor was a-su, which means "he who knows water." The doctor of to-day thinks he knows a great deal, and I sometimes doubt if he uses his knowledge and therapy any better than those away back thousands of years before Christ. We cannot estimate the time of the doctor who knew water and water therapy. And so it is with us. If we wait for our full development, and it comes along about fifty, then why cannot we be successful. Why are those men whose names have been mentioned exceptions? Do not they prove the rule that the mind can be active, fruitful, and can do its best work after such a time?

Major J. Henry Carstens, Detroit, Michigan.—Opportunity has a good deal to do with the development of certain things. We all agree that all men are not successful until they are advanced in years on account of opportunity. Why do they attain success? Because it takes them a long time to acquire knowledge. You cannot acquire knowledge and know everything when you are twenty or thirty years of age. Success at fifty or sixty or seventy is the result of an accumulation of knowledge through all the years of work, and such men have been working in that direction, and if there be anything in the paper that will produce an effect on young

men, it is that they must study and work hard if they would achieve success later in life. If a man has the right kind of brains, quick perception and energy, and above all things, if he works, he will amount to something, and while he may not be able to acquire and promulgate all of his knowledge at thirty or forty, it will be of immense benefit to him at fifty or sixty, but he has got to work when he is young to acquire that knowledge.

Dr. Van Amber Brown (closing).—I wish to make one point clear, that old age is built upon the foundation laid by youth.

CLINICAL, PATHOLOGICAL, AND SOCIOLOGICAL OBSERVATIONS UPON NINETY INTERNED VENEREAL PATIENTS.

BY

JAMES E. DAVIS, A. M., M. D.,

Detroit, Mich.

Interning of prostitutes and libertine patients is a most effective aid in the treatment of venereal diseases. A new environment is thereby provided, renewal of infection is effectively prevented, and intensive treatment can be instituted until both clinical and bacteriological cures are effected. It is admitted that pathologic tissue changes may be incurable yet arresting active processes must be conceded as of the utmost value for the definite limitation of the specific terminal pathology.

The group study of venereal infections suggests many interesting phases pertaining to both the sociologic and the therapeutic reclamation work.

The young girl afflicted with venereal disease is usually ignorant; her sexual education has been wholly neglected, often because of the death of one or both parents, or from ignorance of guardians or friends.

The normality of both mental and physical development is frequently in question. To have lived with the environment so often surrounding these girls is to have contended with physical, mental, and moral inflictions begetting a lowered resistance, and this has to be pitted against persuasions of sexual aggressors. Illustrative of the business life opportunities for young girls, citation is made of the so-called Dancing Camps, where young girls are employed from 7.00 p. m. until twelve midnight, receiving for each dance a five cent check. During the day employment in factories is found from 7.00 a. m. until 5.00 p. m. Here overwork, loss of sleep, small pay, and a variety of sexual stimulation become a daily monotony. The aggressor has only to pity and then embrace.

One of this series at the age of fifteen, under the urging of the

mother for more money, accepted a dancing camp position to increase her income. Later she became the common law wife of one of her associates in the factory, whom she also met in the dancing camp, with resulting gonorrhea, syphilis, pregnancy, miscarriage, and internment. The man of the narrative was drafted; his blood was examined, gave a four *plus* Wassermann reaction, and he named the girl as infector. She in turn was promptly interned.

The discussion upon the control of venereal disease has been notoriously impotent as have been the so-called practical measures enacted under the best of conditions. There are now perhaps three outstanding historical examples of effectual control, namely, those of Cromwell's army, the Japanese army, and the present United States army. As a means of national efficiency in man power, it became necessary to do what national courage under peace conditions was not equal to doing. The military examples, with their results, suggest that exercising necessary control with adequate intensive treatment is the practical solution of the venereal problem.

The clinical and pathologic observations in the following ninety cases are from material interned at the Wm. Booth Memorial Hospital by the City and State Boards of Health.

Twenty-nine of the group were closely questioned relative to the causative factors of their condition. In obtaining this data veracity of statement and freedom of speech were encouraged by having each patient understand that all information was to be voluntarily given, and in each instance where the truth could not be told, no answer was desired. Each one questioned was given assurance that her identity would not in any way be connected with the information divulged. It is believed that the statistical data obtained are reliable.

The following facts were elicited: 60 per cent. complained of unpleasant home surroundings; 40 per cent. had lost their mothers by death; 20 per cent. were the daughters of divorced parents; 40 per cent. had left school to work at ages varying from twelve to seventeen; yet 55 per cent. of them had completed the eighth grade or better in school, while one, in addition to finishing High School, had also taken a course in a Business college. Fifteen per cent. only had received a fair sex education from their mothers; 20 per cent. had received this information from some member of the family, while the remainder, 65 per cent., were left to get this information as best they could. None of them had received any instructions concerning venereal disease; instruction of this nature

is now being given by illustrated lectures as a part of the routine hospital treatment. When questioned with regard to their first sexual experience, there were but 15 per cent. who gave a history of compulsion, while 6 per cent. only admitted that they had received money for sexual relations. It is worth noting that, while these patients were all sent to the hospital with a diagnosis of syphilis or gonorrhea, there were no confessions of professional prostitution. The majority declared that had they known more about the results of sexual relations, and especially about venereal disease, they might have avoided getting into trouble.

The gynecologic examination of each patient was standardized so as to involve a routine critical study of the external and internal genitalia in the following sequence; labia, clitoris, hymen, major vestibular glands and ducts, urinary meatus, perineum, vagina, cervix, uterus, and adnexa.

The variation exhibited in the labia as to form was not significant: a few cases were infantile in development, particularly in the minor labia. In the colored patients there was a relative disproportion of the major and minor labia with an increased size of the minor divisions. The disproportions of form and size in the right and left sides were insignificant. The structural changes included only a few cases of slight pressure atrophy of the central fat bodies; this can doubtless be attributed to the fact that but few were professional prostitutes as well as to the youth of the patients. A few cases of general furunculosis were observed.

Condylomata acuminata were observed in 5 per cent. of the cases, condyloma lata in 3 per cent. while chancres were found in 10 per cent. The clitoris showed almost no changes other than slight hypertrophy and minor adhesions. The hymen showed in caruncular remnants only. The usual atrophic changes were not marked.

The major vestibular glands showed an unexpected constancy in position and palpability. In only two cases were the glands anterior to the midpoint of the vestibule. In all cases the glands were palpable, and the gland positions were uniformly close to the pubic rami, the outer border being definitely attached to the ramus by a ligamentous formation. A technic was employed by which the finger, placed within the vagina, with its tip against the inner aspect of the pubic ramus, is made to hook the levator ani and the vulvar tissue into an extreme forward position. Counter-rolling pressure is made upon the cutaneous surface with the tip of the thumb touching the outer surface of the ramus, thus enabling easy palpation of the gland and duct. With this method of fixation, gland and duct

secretion may be definitely expressed and considerable amounts obtained for smears, at the same time an excellent exposure of the duct meatus is obtained. The pathology of the major vestibular gland apparatus is easily and frequently overlooked. In this series 50 per cent. of involvement was demonstrable. Cyst and abscess formation were present in 3.3 per cent. of the series. It is to be expected that frequent coition may be a means of excessive expression of the gland and duct secretion. Hypertrophy and induration of one or both glands and ducts were very frequently observed.

The urinary meatus, which is doubtless the preferred habitat of the gonococcus, exhibited very few visible tissue changes. A periurethromeatal hypertrophy and hyperplasia, however, were observed in a number of instances. There was not a single instance of urethral caruncle formation, although a diagnosis of potential caruncle was made in a few cases.

It is to be supposed that from this class we find a large percentage of carunculæ developing after forty-five years of age.

A striking frequency of extensive involvement by condylomata of the vagina well into the cervix was noted.

Visibility of venereal pathology is most distinct in the cervix uteri. In 70 per cent. of this series spectacular gross changes were observed, which varied from the fiery scarlet red appearance to the enormously hypertrophied and hyperplastic cervix which glistened with bulging retention cysts, erosion, ectropion, endocervicitis, and excessive tenacious mucus; and about the os was seen a free-flowing nontenacious secretion of greenish milk-like color which oozed from the slightly everted tall epithelial-celled surface.

In almost all cases the external os was relaxed, and the internal os was seldom found open.

The gross cervical and fundal changes were distinctly contrasted in the majority of the cases of the series. In relatively few were fundal changes demonstrable, excepting as seen in deviating positions from adnexal involvement. The cases with gross corporal changes belonged largely to the multipara. Demonstrable endometritis was recorded in approximately 50 per cent. of the series. Subinvolution and metritis were observed in two cases following miscarriage.

Deviations of the cervix and of the uterine body to the left of the vaginal axis were observed so frequently as to deserve comment. This deviation in many cases was not due to adhesions, for the positions became automatically corrected in from one to two weeks after admission to the hospital.

Comparatively few backward displacements of the uterus were observed, and these were all in degrees of flexion. Left lateral deviations from adnexal changes were very frequently noticed.

The pathology of the adnexa was most frequently and extensively present upon the left side as salpingitis, perimetritis, parametritis, ovaritis, peritonitis, and cellulitis. Salpingitis was demonstrated in 41 per cent. of the cases in the series. Ovaritis, as here classified, includes adhesions by which these organs were secondarily involved following a primary salpingitis. Tissue sections in this class of cases have proven that the ovary proper is not easily involved, as a rule, in the early gonococcal infections. What is termed a periovaritis, and pressure changes incident to the increase of surrounding connective tissue, were commonly seen.

Of the series, 4 or 3.4 per cent. were operated upon for late salpingitis with adhesions, and secondary involvement of the appendix vermiformis.

In view of the pathologic changes observed, and with due consideration of the subjective symptomatology, one is amazed at the discrepancy in their correlation. It is indeed seldom that one can obtain the slightest history of even minor discomfort. Almost all cases disclaim knowledge of infection until so informed. The question might well be raised: Are there mutations of the organisms, and are cellular tolerations established by variations in the strains of organisms through promiscuous intercourse. Individual infections seen in private practice appear to have a fairly well correlated pathology and symptomatology. In cases where rapid tissue changes exist, pain or other discomfort is shown. In slow cases processes of cellular compensatory changes become established.

All cases of the series were examined serologically by the State Board of Health. Bacteriologic examination of the smears taken from the urethral meatus, Bartholin duct meati, cervix uteri, and vagina were repeatedly made under the supervision of Mr. H. L. Clark, hospital bacteriologist. Methylene blue and Gram strains were employed, using the diagnostic criteria of intracellular organisms of characteristic morphology disposed in definite clusters and having the necessary specific staining affinities.

Clinically and bacteriologically cured cases were so judged after the clinical disappearance of all lesions, and after obtaining negative Wassermann reactions before and after provocative salvarsan injections, and after five consecutive smears, preceding which provocative doses of gonococcal vaccine had been administered.

SUMMARY.

Average age of patients, 17 years. Married 14.	
Average length of time patients were confined in hospital	13 weeks
Average cost to the State per patient	$195
Gonorrhea and syphilis, total number of cases	90
Syphilis	46
Gonorrhea, with positive laboratory findings	72
Gonorrhea, clinically positive, laboratory findings negative	10
Extent of involvement:	
Urethritis	49
Bartholinitis	45
Vaginitis	49
Cervicitis	63
Endometritis	14
Salpingitis	37
Oöphoritis	30
TREATMENTS:	
For syphilis:	
Novarsenobenzol, average number of treatments per patient	4.3
Mercury salicylate, average number of treatments per patient	11
For gonorrhea:	
Silver nitrate, 10 per cent. sol., average number of treatments	14
Iodine, 3.5 per cent. sol., average number of treatments.	11

Each patient received also daily douches of biniodide of mercury. (Because of the pain complained of by patients receiving the iodine treatments, they have been discontinued in favor of the silver nitrate.)

DISCUSSION.

MAJOR JOHN W. KEEFE, Providence, Rhode Island.—There are some phases of this work that will require careful consideration. In our State last winter the legislature passed a law to the effect that the physician in attendance at the State institutions could retain a man or woman who was undergoing a sentence, although the sentence might expire, until all evidences of the individual being able to distribute venereal disease had passed. How is the physician to determine as to when an individual with syphilis, for instance, cannot distribute the disease? We cannot always depend upon laboratory tests. It was thought that there might be some error about the reports on the Wassermann reaction, therefore blood was taken from a woman who had been a prostitute and had syphilis, and this blood was put into two different test-tubes and sent to the State laboratory to be examined under different names. One report showed a four plus Wassermann, and the other report was negative.

So you see, the Board that controls this work has quite a responsibility in deciding the question, shall that woman stay there a month or two months or more? It is possible for our laboratory men to make errors, so that there are many phases of this question that we should consider, although I feel confident that the work itself is in the right direction.

Dr. James E. Sadlier, Poughkeepsie, New York.—*A propôs* of this extremely timely and instructive paper, it occurs to me that perhaps it may not be generally known this subject is now amenable to a certain amount of federal financial aid. In the endeavor to protect the draft registrants at the source of infection in city or town, and realizing the state, city and municipal authorities have not provided adequate financial means to carry out the proper program, there was introduced in Washington a bill appropriating a large sum of money not only for original investigation along these lines but as well for treatment. Such an act was passed by Congress and signed by the President and is now in operation.

Dr. Davis (closing).—I am very glad that Dr. Keefe brought up the point about the length of stay of patients in the hospital. That is a question we have had some difficulty over. We have in this State a Social Service Department, and that department, of course, naturally is anxious to have as large a number of these patients treated as possible and to have those who are interned relieved of the internment as early as possible. The medical control of the work, on the other hand, has the responsibility of keeping these patients until they are reasonably safe. In this State the Board of Health has assumed that under the present conditions we are compelled to continue the internment only until the case becomes a closed one, and no longer an open infectious case. That is the position taken at the present time.

This whole problem of when to dismiss a patient and as to whether gonorrhea is ever absolutely cured, is one that will admit of very extensive discussion. Personally, I believe that if we base a judgment upon structural changes or actual findings, locating the gonococcus definitely within the tissues, perhaps in a perfectly safe position where it may never perhaps become again a means of infection, our decision of a satisfactory cure may be all right, yet we do not know, and we have no means of knowing whether under certain conditions that a little pocket may be opened and reinfection may take place. Therefore, until the organism is free from the tissues, we may not have a definite cure. The only thing we can do is to dismiss these patients when we have a clinical and bacteriological cure established. I would not dismiss a patient upon bacteriological findings only. We have had numerous instances where these findings were negative, and yet the cases were actively gonorrheal. We keep these cases for more extended treatments. That is the only position I think we can take. It is never safe to depend upon laboratory work alone. Laboratory work should be taken as evidence in the case, and it should be correlated with the clinical findings, and then we can make a judgment that is relatively very safe. That is the position we should take upon this question.

The gonococcus has definitely been demonstrated as being virulent after six years or longer, definitely located in the tissues. We do not know how long it may remain. We must resort to the gathering of all evidence and dismiss our case according to the findings.

In regard to the Wassermann test, at present it is very unsatisfactory, and in my opinion the man who does three or four or a dozen Wassermann tests once or twice or three times a week may be unreliable in his reports; whereas the man who does a thousand a week will be able to give very reliable information.

Major J. Henry Carstens, Detroit, Michigan.—I am very glad that Dr. Bainbridge has said what he has. Dr. Davis has shown us what ought to be done in the management of these cases, and I think his paper will serve as a model for a great many other large cities, especially around the cantonments.

A CASE OF INTERSTITIAL TUBAL PREGNANCY.

BY

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Indianapolis, Ind.

Interstitial tubal pregnancy is, undoubtedly, of more frequent occurrence than we formerly believed; this conviction is due to the more careful observation and report of specimens in recent years. Lawson Tait, in commenting upon a postmortem specimen, which was presented to him, wrote: "In the enormous experience I have now had of tubal pregnancy this is my solitary experience of interstitial tubal pregnancy, but it so closely resembles a number which I have seen in museums, that I take it to be quite typical of its class. I am, therefore, disposed to believe, from physical examination, that interstitial tubal pregnancy could not be diagnosticated, and I can imagine no symptoms which would help us to recognize it before rupture."

Only five or six museum specimens were known at the time I reported a unique case to this Association at the St. Louis meeting. This case I operated upon in the fifth month of gestation, and before rupture. The gross appearance in this case was that of a large reddish bag which had developed from the wall of the right uterine horn, involving the tube, while the left side of the uterus was but slightly enlarged, which made a very unusual appearance on account of the resulting asymmetry. With a desire to save the uterus, I did what was practically a Cesarean operation, excepting that, the uterine cavity not being invaded, I placed a large tube through the abdominal incision, thus obviating the danger of exposing the uterine wound to infection from the vaginal tract in providing drainage through that canal. A rather troublesome adhesion at the site of drainage was later released surgically.

In recent years numerous cases of interstitial pregnancy have been reported, but all of them, so far as I have learned, ruptured before they came into the hands of the surgeon, and some were postmortem specimens.

It would appear that the history of interstitial pregnancy differs from that of other forms of tubal pregnancy only in that, as the

uterine wall is capable of much greater distention than is the unsupported tube, rupture may not occur until a later period. This was exemplified in the case to which I have alluded, and which had not ruptured though well into the fifth month.

On June 6th, of this year, I operated on a second case of interstitial pregnancy in the eighth week of gestation, which had ruptured two weeks previously. The woman lived in the country, and had had little attention until symptoms of serious infection developed, when she was brought to St. Vincent's Hospital, Indianapolis. On opening the abdomen the characteristic quantity of clots and débris was encountered, and also a quantity of walled-off pus in the cul-de-sac. A crater-like opening in the left posterior side of the fundus showed the site of the pregnancy which did not involve the uterine cavity. After removing the clots I pared the ragged edges of the rent in the uterine wall, and with little difficulty folded the organ slightly upon itself and closed the rent with catgut, leaving the lowest point in the damaged wall patulous for drainage, and then placed a large rubber tube through the cul-de-sac into the vagina. After a few days of extreme weakness the patient proceeded with a satisfactory convalescence.

L. S. Stone(1) reported a case in which an interstitial pregnancy of five and a half months had ruptured. He operated, and did a hysterectomy. The patient recovered.

W. Kohlman(2) made observations on two cases; one, at four months; the other, period of gestation not stated, but which presented the peculiar history of having had the *tube and ovary of the right side removed* sixteen months previously, and yet it was in *this interstitial segment* that the pregnancy occurred. Both cases were treated alike by hysterectomy, and both recovered.

A. H. Harrigan(3) and Dr. Norris each reports a case without giving periods in which hysterectomy was done, and both cases recovered.

H. N. Vineberg(4) reports a case of early interstitial pregnancy in which he repaired the damaged wall, the patient leaving the hospital in ten days.

Lillian Farrar(5) opened the abdomen in an interstitial pregnancy of about six weeks, and then dilated the cervical canal, and, going through the septum, curetted the gestation cavity, the patient making a good recovery.

G. G. Wood(6) operated upon a case which ruptured at four months. Hysterectomy resulted in recovery. A similar case occurred in the service of Dr. West, at the Post-Graduate Hospital,

and one was reported by G. W. Kosmak, and one by J. W. Markoe, the treatment of which I did not learn.

Nacke(7) reported a case, rupturing in second month, in which he repaired the rent in the uterine wall, with resulting good recovery.

F. W. Johnson(8) evacuated a case, which had ruptured at four months, in which he repaired the uterine wall, with happy recovery.

Bellecombe of Paris, truly says that the clinical diagnosis of ectopic pregnancy, with an interstitial localization, is extremely difficult, and can only be confirmed after laparotomy. An asymmetrical enlargement of the uterus, the existence of a cystic tumor at the level of the uterine horn, asymmetry in the insertion of the tubes and especially of the round ligaments, represent the principal features of such a diagnosis. As to the treatment of these cases he says the following rule has been definitely formulated by Legond: "All interstitial pregnancies, recognized on laparotomy, call for immediate performance of supravaginal or total abdominal hysterectomy."

A majority of the cases here referred to were treated according to this dictum, but several of them were treated more conservatively, and all of the cases, the records of which I have had access to, have recovered; so that it may well be that in some cases the radical operation is clearly indicated, while in others we may still be left with an opportunity to gratify our natural desire to be conservative and make the repairs necessary to permit the woman to retain a normal organ capable of performing its accustomed physiological functions.

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SOME OF THE DIFFICULTIES, FAILURES AND OPPORTUNITIES OF WAR SURGERY.

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It is almost impossible for any one observer to obtain a proper perspective of war surgery; hence the somewhat contradictory and inconsistent views which make their appearance from time to time. This subject is so vast and the interrelations and bearings of one portion upon another so complicated, that a distorted view is likely to be taken by the most competent observer whose statistics and impressions have been obtained while he has been attached to but one of the many sanitary formations in the zones through which a wounded soldier passes on his way from the front to the base or interior.

The arrangements within these zones and their relations to each other are somewhat similar in the American and British sanitary formations, while the French Service de Santé differs in some material respects which will be mentioned from time to time.

A comprehensive view of the difficulties and failures which beset the surgery of war necessitates a stay of some time in the various sectors and zones through which the wounded soldier is evacuated, and is not to be obtained by a hurried trip from a base to a front operating station, nor from the latter to an advanced station or regimental aid post. For example, two wholly diverse and contradictory reports would be made by two equally competent observers visiting the same organizations if one had made his visit during quiet trench warfare and the other during open battle. To the first, every post would be overstaffed and underworked; to the second, exactly the reverse. To the one, equipment transportation and operative methods would seem to be all that could be desired; to the other, all would seem inadequate.

It is the writer's object to give a simplified view of the subject as it exists, pointing out from time to time the differences wrought by changed conditions at the front.

As mentioned above, the British formations and our own are

organized upon much the same basic principles in that the same zones exist and practically the same work is performed by the various formations, not always, however, functioning under similar names. With this understanding either British or American nomenclature, or both, will be used as may seem preferable when individual sanitary formations are mentioned.

At this point a brief explanation may serve to fix in mind the work that these individual organizations perform, with the lines of demarcation between the various zones from front to rear—the term "front" here having reference to the front line from a military standpoint rather than the general acceptation of that term, which has been so expanded by lay writers as to include almost every point in France not occupied by the enemy. It must be understood that this description is skeletonized in the interest of simplicity, that it leaves out some formations of importance which are not germane to the subject in hand, and also that a change from trench to open warfare, if permanent, will of necessity force important changes in organization.

In the first zone the battalion or regimental surgeon functions, a hard and fast line being drawn between him and his colleagues in the second zone. Into this second zone he does not go, and although he is under the medical direction of his division surgeon, it must be remembered that his immediate commanding officer is the colonel of the line in whose regiment or battalion he is serving, and that his post is either the regimental aid post or regimental headquarters. Immediately behind this, but still under divisional authority, is the field ambulance with its advanced dressing station, main dressing station, and horse and motor ambulance system. Again the medical officers serving in this zone are permanently attached thereto in principle, although an occasional battalion surgeon may wander back by transfer, or the casualty clearing station surgeon go forward in a similar manner.

The British main dressing station corresponds somewhat to the American field hospital, but the circumstances of trench warfare have tended more and more to evolve this into a dressing station for the slightly wounded.

With this zone divisional authority ceases, and the next, now termed S. O. S. in the American L. O. C. in the British Army, is entered. The chief formations devoted to surgery are the casualty clearing stations, American evacuation hospital, and stationary and base hospitals under the direction of authorities connected with the base group. Even here there are in principle surgeons permanently with

the casualty clearing stations and surgeons permanently attached to base groups, although surgical teams from the latter are sent forward in emergencies to enlarge the personnel of the former.

Last in this list of zones comes the area wholly outside the theatre of operations, known as the interior, with its general hospitals, etc., at which all the protracted cases either of wounds or illness, will eventually arrive. It is thus apparent that there exist four distinct zones through which a wounded soldier will pass before recovery, and in this arrangement lies an element of strength in that the personnel of each zone becomes thoroughly familiar with its duties. Unfortunately there also lies in this certain elements of weakness, in that the battalion surgeon knows nothing of what happens to his patients at the advanced dressing station or formations further to the rear, the field ambulance surgeon knows only what has happened in front of him and what measures he instituted, but of the ultimate results nothing at all, and the casualty clearing station operator may not know to what base his patient was evacuated, or how his plan of operation or intervention worked out, while the base surgeon ultimately concludes that the wound left open, or wound closed, or the one treated with this, that, or the other antiseptic has done better than another, while he has a wholly inadequate idea of what actually befell the patient before his arrival at the base.

The Service de Santé has endeavored to correct certain defects inherent in this system by forming a close liaison between all the sanitary groups from the regimental aid post to the base hospital, establishing certain groupings for distinct types of injuries, and the organization of a Centre Chirurgical Avancé between the advanced dressing station and evacuation hospital, where are performed operations upon the wounded referred to this Centre because of the especial character of their injuries—all of which are of advantage in more than one respect both to the patients and the medical officers who man the ambulances and hospitals.

LOCATION AND EQUIPMENT OF FORMATIONS.

In infantry regiments the regimental aid post is established in the vicinity of battalion or regimental headquarters and must be in or about the front line trenches. Its actual housing may be a dug-out, a cave, or the cellar of an abandoned building, and its equipment is necessarily limited to first-aid essentials. For the British battalion one medical officer suffices with his complement of noncommissioned officers and stretcher bearers, and the business of the medical officer

and his bearers, so far as the wounded are concerned, is to pick them up, collect them at the post, check violent hemorrhage, splint fractures, apply dressings, administer morphine and antitetanus serum, keep them as warm as possible, and see that they are taken out of the way at the earliest possible moment through the agency of bearers sent forward from the nearest formation in the rear, viz., the field ambulance, whose foremost post is the advanced dressing station.

The advanced dressing station to all intents and purposes is an amplified regimental aid post. It is located at such point as may be available—usually behind the zone of small arms fire—but always within artillery range. It must therefore be protected, and its location is governed to a great extent by the possibilities of the terrain, the presence of natural caves or abandoned breweries, sugar refineries, factories, chateaux, etc., containing cellars and underground passages. Its personnel is larger than that of the regimental aid post and its equipment more elaborate, but it is obvious that no provision can be made for set operative procedures. Ordinarily it will house more patients, immediate evacuation is not so imperative, a badly shattered extremity may be removed, and more adequate facilities can be provided for warming the patient and overcoming shock, but it is by no means a place where formal work can be done or patients be retained for more than a few hours.

Great numbers of slightly wounded may be sidetracked from either of the foregoing to the main dressing station, but the seriously wounded upon evacuation from the advanced dressing station will be taken directly to the casualty clearing station where for the first time adequate housing and operating facilities can be provided. Attempts have been made to establish the correct distance behind the front lines for casualty clearing stations, but in the face of actual conditions an ideal is rarely attained. It is desirable that they be above ground—and ammunition dumps, aerodromes, batteries, and rail-heads must be avoided if possible in order to escape accidental shelling and bombing. At the same time they should receive and care for patients at the earliest possible moment in order to treat shock, stop hemorrhage, and, most important of all, to operate before a dirty, mud-stained, bacteria-laden wound has become an infected wound. For convenience in evacuating they must be situated upon, or in close proximity to, a railroad, while avoiding a rail-head; and it is readily recognized that such a formation may be anywhere between 5 and 25 miles from the front-line trenches. In fact, a compromise between all the conflicting factors is the

inevitable outcome of any attempt to locate a casualty clearing station. During a period of quiet trench warfare a minimum of 5 or 6 miles may be attainable; during an advance they may be left far behind; while during a retreat they may be obliged to hurry well to the rear in order to avoid total demolition. The necessity for semimobility does not permit permanent housing, and accommodations are therefore furnished by means of tents and portable huts of various types.

Theoretically casualty clearing stations work in pairs, one receiving one day, and the other the next, their combined capacity being eleven hundred. Practically they may accommodate more or less than this number, as one may receive its capacity within a few hours, when the other must begin to function; more than two may be required at some points, it may not be possible to place them in pairs, and permanent buildings must be utilized under some circumstances.

The French Auto-chir shows here to advantage in that the total operating unit and equipment is conveyed from point to point by automobile trucks built for this express purpose; and while time is required to install them or take them down, the motor transportation afforded renders it possible, on the whole, to move with relative rapidity.

Base hospitals are regarded as immobile units, established in locations sufficiently far from the fighting zone to be perfectly safe so far as accidental shelling and bombing are concerned. Their size is sometimes a matter of choice, but often is governed by circumstances; and their equipment is that of other well-regulated hospitals. They are subject to periods of great activity, when patients must be evacuated to the interior as rapidly as possible, and also to periods of inactivity, depending upon the number of wounded admitted to the front formations. Inasmuch as severe fighting usually is preceded and followed by quiet trench warfare of many weeks' duration, it is evident that base hospitals may at times retain their patients for considerable periods, while at others they must act almost as promptly as evacuation hospitals.

TRANSPORTATION.

Any discussion of the difficulties and failures inherent in war surgery would be incomplete without a consideration of the transportation problems involved in moving a man who has been wounded in "No man's land," the trenches, or in open battle, because this factor of transportation seems to be the one least appreciated by those who have not witnessed it in operation.

The methods of transportation available are stretcher bearers with litters, two-wheeled carts, and hand-pushed tram cars on narrow-gage railways; either ordinary or ambulance cars drawn by gasoline tractors or small engines on narrow-gage railways; horse-drawn ambulances, motor ambulances, ambulance trains on broad-gage railways, canal boats and hospital ships—truly a formidable array of motive power, but each having its own sphere of usefulwess. To this I have recently seen added a beautiful wheel-barrow litter (on pneumatic tires) pushed by one man, which would be an ideal contrivance but for one unfortunate fact—in the forward area, where such a vehicle would save much discomfort, it could not be used.

The stretcher bearers attached to the regimental organization must find the wounded and convey them by hand-power to the point selected for the regimental aid post. This may be a carry of but a few yards, or one of half a mile or more. From the regimental aid post to the advanced dressing station the carry is again almost certain to be by hand, over slippery uneven duck-boards, about trench islands, and around corners and trenches parallel to the fire trench to traverses and back again, sometimes over the débris of a destroyed fire, traverse, or communicating trench. At times when other than a pitched battle is going on, there may be short stretches screened from direct observation over which a two-wheeled cart can be pushed outside the trench; but ordinarily the entire trip must be made on the stretcher carried by hand, over either a short or long distance depending on the relative locations of the regimental aid post and advanced dressing station. Rarely will it be possible to utilize any type of conveyance other than that handled by man-power, although under very exceptional circumstances a horse-drawn ambulance might pick its way at night to a point beyond the advanced dressing station. The stretcher bearers doing this carry from the regimental aid post to the advanced dressing station, are attached to the latter station of the field ambulance from which they are sent forward, and the length of the carry sometimes necessitates one or more relay points on the way back. From the advanced dressing station to the casualty clearing station or main dressing station some form of horse-drawn or motor-driven vehicle is usually available, although this is not necessarily driven to the door, as might be imagined but more often is stationed some distance away in order to be screened from enemy observation. When a front is more or less stationary, narrow-gage railways may be available, such roads having been constructed extensively for

the conveyance of ammunition, water, and rations to the batteries and troops in the fighting zone. Should the front line go forward, these railways are of necessity left far in the rear; should the line be pushed back, they will be destroyed to prevent their falling into the enemy's hands. While they are extremely valuable under some circumstances, their usefulness in the front area ceases when stationary is changed to open warfare. By means, then, of motor- and horse-drawn vehicles or narrow-gage railway the badly wounded are transported from the advanced dressing station to the casualty clearing station or evacuation hospital.

From the latter point to the base, broad-gage railways with ambulance trains are used, although in some parts of France canal boats make the journey more conveniently and comfortably for the patients. From base to interior, railways or hospital ships are available, the latter, of course, implying an overseas location for hospitals of the interior.

While it is not possible to give exact figures, it is probable that a badly wounded patient will be picked up and laid down upward of 20 or 30 times in the course of his journey from the fire trench to a hospital of the interior.

A Hypothetical Case.—In order to render the foregoing more graphic, let us follow a man from the place where he was wounded back to the base, and point out some of the difficulties to be overcome, taking as our example a soldier with compound fracture of the femur produced by fragments of exploding enemy shell. We may also specify that such a wound occurred during a quiet period, mentioning from time to time the additional difficulties consequent upon trench raids, patrols, or pitched battle.

Wounded in the trenches, such a soldier is altogether likely to be covered with dirt or mud rich in bacterial contents, especially anaërobes such as gas-forming organisms and tetanus bacilli. One of the results of impact of a rough jagged shell fragment, of such size and velocity as to fracture the femur, is certain to be widespread destruction of soft parts, and, of especial importance, death of large areas of muscle.

If the femoral vessels are uninjured, the blood loss may be only moderate; but even slight loss of blood is of serious import under such circumstances. Primary shock is certain to be marked as the combined result of extensive comminution of tissue and intense emotion. It seems to be the concensus of opinion of those fitted to judge by experience on the firing line, that this primary shock is of short duration, provided the injury is not severe enough to cause almost

instant death, and also on condition that proper remedial measures can be promptly applied.

Under the circumstances above mentioned the medical officer will be able to attend the man within a few moments at the point where he fell, or he will be picked up at once and carried to the regimental aid post. In either event the medical officer's resources are limited, but he will have a supply of dressings and either the Thomas or some form of improvised splint. Under very favorable circumstance he may be able to apply warmth, both externally and internally, clean up the skin, and administer morphin before the carry to the advanced dressing station begins. This carry is certain to require an appreciable length of time. Stretcher bearers obliged to walk duck-boards, sometimes carrying shoulder high to pass into the traverses, can by no possibility exceed two miles per hour. During daylight, in a quiet period and under the most favorable circumstances, the patient may reach the advanced dressing station in an hour after his wound was inflicted. Compare now the circumstances of the same man wounded during a night patrol in "No Man's Land," or during hand-to-hand fighting in which first one combatant and then the other occupied the spot on which the wounded man fell. It may be hours before he is found or before it is possible for the regimental stretcher bearers to reach him, even if his location is known. It was within the writer's personal experience in a front formation, to have come down to him a soldier with compound comminuted fracture of the humerus who has worn a tourniquet continuously for forty-eight hours, during which he was a prisoner in the hands of the enemy, but who was eventually taken back by his own men. Pinned to his clothing was a note from a German medical officer stating that he had been too busy to remove the tourniquet. Useless to say that gas gangrene was widespread and immediate disarticulation at the shoulder imperative, from which by great good luck the patient finally recovered.

To return to the original case at the advanced dressing station. The soldier will likely have reached here in a more or less exhausted state; in fact he is almost certain to be in this condition if there was any delay in getting him to the regimental aid post, or if the carry from that post took place during cold, rainy, or snowy weather. Here he will have been provided with dry blankets; his splint, if he has one, will be readjusted, and more adequate dressings will be applied. He may be so thoroughly shocked that he must be retained for one or more hours while an effort is made to overcome shock by the external application of heat, and he likely will receive his first

dose of anti-tetanic serum. During a quiet period, if his general condition is good, he may be evacuated at once to a casualty clearing station or one of the surgical formations in advance of this which are coming to be adopted; during an active battle each ambulance must carry its full load, as it is plainly impossible to provide an ambulance for each badly wounded soldier, and time is lost in loading; or in an active period the crush at the advanced dressing station may be so great that several loads will go out before his turn arrives. He may be taken out on hand-pushed tram cars, but hardly by rail in any other manner, unless he happens to be ready for evacuation at the exact time at which the railway ambulance car arrives.

Up to this time it will be noted that nothing has been done for this man except to get him back out of the zone of small arms fire to a location of comparative safety, and to do all humanly possible to prevent and overcome severe shock and to relieve his pain. These few things alone will have required several hours under the most favorable circumstances.

In spite of the greatest care, his next trip will take time. The ambulance cannot go charging down the road with gong clanging and everyone hurrying out of the way, as if it were in a city street. It must pick its way over shell-torn roads, around and about artillery limbers, ammunition and water carts, and ration transport trains. *The essential thing is to care first for the interests of the uninjured men who are doing the fighting, and upon whom rests the responsibility for the outcome of the battle.*

After arrival at the first formation, whether this be mobile hospital, Centre Chirurgical Avancé, evacuation hospital or casualty clearing station, in which he may secure adequate surgical attention, the course of events again will depend upon whether peace time or "strafe" exists at the front. During a quiet time he will be seen and cared for almost at once. The care which he receives will depend upon his general condition on arrivial and the special predilections of the chief surgeon of the unit, if it is bad. In that event one surgeon may choose to apply warmth, use morphine freely, resort to saline or alkaline infusion or blood transfusion, and operate only after reaction has set in, or not operate at all, if reaction fails to occur; another equally skilful and with the same surgical experience may transfuse at once and operate soon thereafter; while still another will decide that since the wound originally caused the shock, prompt operation with or without transfusion may fulfil the old dictum "to remove the cause."

During a rush period there certainly would be some delay regard-

less of the operating surgeon's views, as it is wholly impracticable to supply enough operating teams to care for all the wounded immediately on their arrival at one of these forward units.

After operation and immobilization, no matter what plan is adopted, early evacuation must be considered. During the winter, and in weather which precludes great activity, the patient may be retained for several days; during battle he must, if possible, be evacuated within twenty-four hours. This evacuation will be accomplished comfortably by ambulance train or ship; but the patient must be lifted from bed to stretcher, on the stretcher into the ambulance, off the ambulance into the train. From this ambulance train he may be evacuated to a base or general hospital, and if fortunate remain here until recovery; but in the example we are following it is probable that the certainty of prolonged convalescence will lead to his evacuation to home territory, which means ambulance, ship ambulance, train ambulance, interior hospital respectively. Probably not before arrival at the interior, and certainly not until arrival at the base, stationary, or general hospital, can a definite plan of consistent, continuous treatment be instituted with nothing but the interests of the patient in view. Up to this time his treatment has been the best that could be applied in consideration of the military exigencies, and even at a stationary, base, or general hospital he may be the subject of hurried evacuation orders, should notification be received that large convoys of recently wounded are due for early arrival.

GENERAL CONSIDERATIONS.

Turning now from our specific example to general considerations, we may ask what are the chief causes of death or catastrophic results in wounded soldiers whose wounds are not immediately fatal because of their location and severity? In very severe wounds (grands blessés of the French), the causes are shock, hemorrhage, and infection; in moderately severe wounds (moyens blessés), hemorrhage and infection, in slight wounds (petits blessés), infection. It will be seen that in this triad, infection is the consistent factor which runs through the entire list, and the two types of infection which remain as the gravest menaces are the anaërobic, responsible for gas gangrene, and streptococcic. The presence of these infections may mean previous inadequate operation, inefficient methods of sterilization of the wounds, or most likely of all, delay—delay until such time as a wound which at first was dirty, only now

has become infected. The points at which this delay occurs and a few of the reasons therefor have been given; and from a consideration of the facts it appears to be the one element which is least likely to be overcome by any means at our command; first, because every possible effort is made to hurry a wounded man away from the front, not only on his own account, but more especially to get him out of the way of the uninjured; second, because on arrival at an operating center of any kind he is cared for as promptly as his condition and the state of affairs at that hospital will permit.

Recognition of the fact that delay so often is responsible for infection has resulted in pushing operating units closer and closer to the front in order to avoid the loss of time consequent upon transportation difficulties. However, the most serious of these difficulties are encountered in what we have termed the first zone, where the percentage of injuries is the highest and where operative procedures are out of the question. The farther toward the rear the wounded man proceeds, the more rapid and comfortable is his transportation.

Further, it is obvious that the nearer to the front an operating unit is placed, the less efficient will be the operative procedures, other things being equal, because the necessity for a high degree of mobility requires that the material for housing and equipment be reduced to the minimum, while operating under fire is not conducive to the best and most complete technic.

In addition to this condition, there exists the necessity for immediate or at least very early evacuation from sanitary formations which are so near to the lines as to be subject to enemy attack at any moment, and it seems to be the common experience that patients evacuated very soon after operation do not do so well as those retained for some days. This fact is especially true of those in whom immediate (distinguished from deferred) primary suture has been performed; therefore wide-open treatment of wounds is more likely to be practised whenever there is need of immediate evacuation.

Where railroad facilities are adequate, it is a question whether soldiers with minor wounds, but nevertheless of the type which definitely need operation, would not do better if they were classified at a station situated as are the casualty clearing stations or evacuation hospitals, placed at once upon a train, and evacuated to a much larger formation which would be feasible one or two hours further back, there to be operated upon and retained until convalescence was complete. This delay certainly would result in a definite increase in the proportion of primary infections. Just as

certainly, less hurried more adequate operation and retention at the hospital in which the operation was performed would result in a greater number of immediate sutures with a shortened convalescence, and these patients are the ones who should go back to their units with the least possible delay. One consequence of this method of management would be that a consistent plan of treatment of the individual case could be followed out by the same surgeon who did the operating.

Consider next the more seriously, but not desperately wounded patient. The same delay at the same points meets him as meets the one with minor wounds. The amount of dead tissue, especially dead muscle, in his wound renders delay more hazardous, for it favors early gas bacillus infection, and persistent oozing may lead to grave blood loss which every hour intensifies. The problem in this case is to effect a compromise between the risks of delay and the risks of hurried operation followed by wide-open wound treatment at an advanced station.

This appears to be the type of patient with which the casualty clearing station or evacuation hospital is best fitted to deal, if great judgment is used in the selection of its site. Practically all of these patients are out of the line for many weeks, some of them permanently; therefore the necessity for immediate suture and short convalescence is less pressing. Many of them can be evacuated early with open wounds and yet have deferred primary suture performed within forty-eight hours; but mature surgical judgment and wide experience are necessary on the part of the medical officer who does the classifying in order that this group may be separated from the one preceding it.

In the third class, are those very gravely injured, in whom shock, hemorrhage, and infection combine to present a problem in which delay is *the* all-important factor. Many of these will die in the first zone before assistance of any sort reaches them, but for those who are found sufficiently early so that death is not inevitable every hour counts enormously. The results of operating under fire, the certainty that some of the operations will not be performed in an aseptic manner, the necessity for wide-open wounds, —all are insignificant factors when compared with the inevitably fatal outcome of intracranial pressure from perforating skull-wounds with hemorrhage, sucking wounds of the thorax, and perforating wounds of the hollow abdominal viscera. Neither are they significant factors when compared with certain loss of limb and probable loss of life for the patient, the hemorrhage from whose wound

has necessitated the application of a tourniquet at the front which has remained in position for more than four or five hours. This class (the "intransportables" of the French), to be treated at all successfully, must be operated upon somewhere in the first or second zones. Every minute counts, and the problem can be solved only as the French first solved it—by mobile hospitals which can be packed on trucks and moved from point to point within a few hours as changing conditions at the front demand. Even here difficulties are encountered, not only in placing hospitals, but in properly classifying patients for operation at this formation than at another where the opportunity for complete work is better.

Nothing has been said concerning the difficulties of organization on a vast scale, the trouble encountered in endeavoring to select the right man for the right place, the handicap afforded by the fact that practically all the medical officers in the field, except the executives, are primarily civilians unaccustomed to military discipline, methods, and necessities. If this is not enough, add to it the question of supplies, for the regimental surgeon, the field ambulance with its dressing stations, the casualty clearing station, and the evacuation hospital, any of which may be here to-day and abandoned under the hottest sort of shell fire to-morrow, and some realization of the difficulties of war surgery may be gained, together with the failures inseparably bound up with these difficulties.

OPPORTUNITIES.

But what of the opportunities? The opportunities for research, experimental and clinical, are almost unlimited, and in respect to these a sharp differentiation must be made. In experimental work the factors are all more completely under control—in clinical investigation many are not—and the statistical method, when applied to clinical observation under ordinary circumstances and with a small number of cases, fails utterly to produce trustworthy conclusions. Occasionally, as in tetanus, the percentage of incidence and mortality rate are so high that a relatively small number of cases give accurate statistical data; but after all, it required something on the scale of the present war to demonstrate beyond the shadow of a doubt, the efficacy of the prophylactic use of antitetanic serum, which may be said to be the outstanding triumph of war surgery up to the present time. Further, the results have been so startling as to justify all the animal experimentation ever made, if it had no other result than the discovery of this agent for the prevention of tetanus.

Those who, in the face of the results obtained, continue to inveigh against the use of the lower animals for medical vivisection, or the injection of "poison into the blood" for the prevention and cure of disease, could not possibly persist in this line of activity if they were possessed of most ordinary intelligence and simultaneously had an honest desire to know even a fraction of the truth.

Laboratory evidence standing by itself, however, rarely convinces. It points the way, but the conclusive findings are obtained only when that evidence has been thoroughly sifted by experience, and this involves a long period before the pertinent clinical facts are crystallized from the sea of theories in which they are likely to be involved. A witness to the correctness of this statement may be found in a study of the principles of asepsis and antisepsis from Lord Lister's time down to the present.

War surgery, however, offers an opportunity for the establishment of a clinical laboratory on a colossal scale of which advantage could be taken, should some prodigy of organizing ability arise to coördinate the various factors involved, and the results obtained not only would be independent of the skill of individual operators, but also independent of the fallacy which attends upon individual opinion. It is true that a variety of investigating committees have been formed and a large number of individuals have carried out research along many different lines; but they are hampered in war surgery by precisely the same factors that interfere with trustworthy conclusions in civil surgery. Many surgical problems which are bewildering in their complexity could be solved by the statistical method if the investigations were carried out under the direction of one head, who could control the professional (as distinguished from administrative) technic from front to rear. This would necessitate the establishment of zones corresponding perhaps to army zones, of which this head should have charge, where problems like the nature, cause, and treatment of shock, and the value or otherwise of the host of antiseptics now advocated for the sterilization of wounds, could be settled.

To make this clear, let us take one of the simpler problems, such as an attempt to determine *clinically* the wound sterilizing value of Dakin's solution, flavine and dichloramin T. First, some definite type of wound must be selected for observation, such as shell and grenade wounds of the soft parts only. In the zone in which this is to be carried out all of the sanitary posts from the regimental aid post back to the base must be notified to use precisely the same method of skin sterilization; and changes of location on the part

of front line a unitsre so frequent as to render this a matter of some difficulty.

Next, the evacuation hospitals in this zone would have to be instructed to use a uniform method of operation as regards excision and suture of these wounds. They would then be divided into four series: one to use decinormal saline for wound flushing, the second, Dakin's, the third, flavine, the fourth, dichloramin T. Whether the cases were observed simultaneously or one after the other might be immaterial, but in the interest of simplicity the consecutive method would likely be the best. All these institutions must then either be connected for evacuation purposes with rear hospitals instructed to use the same methods, or else a note of the treatment adopted be transmitted in the patient's evacuation envelope and the hospital to which he is evacuated be compelled to adhere to the same line of treatment.

With the saline as a control, a statistical statement based on the average time required for complete healing in each of the four series would settle once and for all whether any of the antiseptics employed were of value, and if so, which was possessed of the greatest. Irregularities would be certain to present themselves; wounds of the upper extremity might be relatively more common in one sector than in another, wounds of the thigh very frequent in deep mud, and leg wounds conspicuous by their absence; but if the observations were continued over a sufficient period, these irregularities would equalize themselves.

Again, take the question of suturing. The usefulness or otherwise of any antiseptic having been determined as above, and a uniform method and uniform material having been agreed upon, a demonstration could be made of the relative time required for complete healing in a limited type of wounds such as were used above, (*a*) after immediate suture, (*b*) after deferred primary suture, (*c*) after secondary suture, (*d*) of wounds treated wide-open from start to finish.

This method might be followed in studying an unlimited number of surgical problems, and moreover, without risk to the patient, since all the methods are in use by some surgeons. Unfortunately, however, under such circumstances the patient is treated in one way to-day and by some one else in a wholly different manner next week, so that the results obtained by these methods are confused even more completely than by the "post hoc ergo propter hoc" habit of thought in the surgery of civil life.

CONCLUSIONS.

1. The failures encountered in war surgery are due more largely to military exigencies than to any difficulties connected with war wounds *per se*.

2. By reason of military exigencies the question of locating the wounded and their rapid transportation from the front areas are not only the most important, but apparently the least amenable to improvement.

3. Aside from the class known as intransportables it is questionable whether evacuation to a very large adequately equipped surgical formation for primary operation would not prove more satisfactory, under ordinary circumstances, even at the expense of an additional delay of one or at most two hours.

4. The opportunity for clinical research is nevertheless almost unlimited and the outlook for good results is promising in direct proportion to the possibility of organization with this end in view.

RUPTURED APPENDIX; RECURRENT CYST OF PAROVARIUM; INTESTINAL OBSTRUCTION FOLLOWING THE GILLIAM OPERATION; THREE TUBAL CONCEPTIONS IN ONE WOMAN; TWO CASES ILLUSTRATING RAPIDITY OF TUBAL REGENERATION.

BY

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THE following case reports I shall present as concisely as possible, giving only the details that have direct bearing on the points to be emphasized. The cases are of varying pathology, but each has an interest somewhat out of the ordinary.

RUPTURED APPENDIX IN A CHILD OF TEN MONTHS.

Doris K., ten months old, had presented no disturbances of moment since birth, and had been more or less under the feeding directions of a pediatrician for some months. The diet consisted largely of modified milk, with some cereals, fruit juices, and strained spinach. Late in the evening the parents noticed, while they were out with the child in her carriage, that she was somewhat fretful and wanted to be carried, but had eaten the evening meal as usual. Toward morning the rapid breathing and listless condition of the child alarmed the mother, who called Dr. Edith Brownsill. She found the child in a state of marked collapse; pulse and respiration rapid; skin white and clammy; and at once called me as consultant. We found the abdomen generally tender to light pressure and dull on percussion over the bladder and right inguinal region. As the child had not urinated during the night, we passed a catheter to determine whether the dull area was not bladder distention. Only a small quantity of urine was present, and no variation of dulness resulted. The general appearance of the child denoted a serious condition, and suspecting an intussusception as the most likely cause, even though no blood had been passed, we took him to the hospital. Here an examination per rectum under anesthesia showed the two findings supposedly diagnostic of ileocecal intussusception—the vacant iliac region and the tumor mass in the right hypochondriac

region. Operation, however, through the middle third of the rectus showed a large amount of flocculent fluid free in the abdomen, a high cecum with an almost adult sized appendix gangrenous over two large hard dark concretions. There was only an elementary omentum, and no evidence of protective adhesions anywhere.

The convalescence was uneventful; with drainage sinus closed within a week.

The main point of interest in the case was the simulation of an intussusception, which stimulated immediate operation and, probably thus saved the child's life. The literature at my command is rather meager on acute perforative appendicitis during the first year of life.

RECURRENT PAROVARIAN CYST.

Mrs. A., aged sixty-seven, was operated upon about March, 1917, for some pathology of the gall-bladder, which necessitated its removal. She had had four or five operations on the perineum because of poor support results. Exploration of the pelvis at the time of the gall-bladder excision revealed nothing abnormal.

On July 22, 1917, another abdominal section was done for a large rapidly growing tumor in the right inguinal region that had been discovered a few weeks before. The doctor in attendance reported that the same surgeon then found a large cystic growth filled with mucoid material arising from the right ovarian region. The abdomen also contained a large amount of the same gelatinous material. The growth, with the right tube and ovary, was removed. The pathologist reported a cyst of probable malignant tendency.

Until November, 1917, the patient was in good enough physical condition to refrain from reporting to her physician, but by November 15 was confined to bed feeling badly.

I first saw Mrs. A. on January 12, 1918. Her general physical condition was fair, but the abdomen was markedly distended. Pelvic examination disclosed a large cystic mass filling the whole lower abdomen, and crowding down between the rectum and vagina so as to almost bulge from the vulva. The pressure symptoms were sufficiently grave to warrant an attempt at even temporary relief.

Operation on January 16, 1918, disclosed a large cyst filling the lower abdomen and extending above the umbilicus. A large amount of gelatinous fluid was free in the abdominal cavity, but the peritoneum presented no growths, though it was markedly congested. The growth proved to be a cyst whose walls were formed by the layers of the right broad ligament and the distended uterine body; its contents were of the same gelatinous material. The left tube and ovary were normal. The removal of the cyst left the ureters and pelvic vessels stripped of peritoneum, and the vagina and rectum separated to the rectovesical fascia layer. The anterior rectal wall presented the only area where the tissues composing the cyst wall could not be well differentiated. A loose pack was placed in the pelvic cavity protruding from the vagina, and the abdomen closed without drainage above.

The day the gauze was removed 50 milligrams of radium well screened was placed in the vault for twelve hours. Ten days later an application of the same dose was made and directed toward the rectum about the middle third of the vagina.

The Western Laboratories made an extract from the fluid and cyst walls, which, however, we have not used.

Dr. Moore reported the growth to be a large multilocular cyst. The cyst cavities varied from a few millimeters to ten centimeters in diameter and were filled with a clear gelatinous material. Microscopically the stroma was composed of fibrous and elastic connective tissue with a few smooth cells. The cyst cavities were lined with a single layer of cuboidal epithelium.

The pelvis has remained without induration, and the scar tissue in the vagina, resulting from the perineal repairs, has softened markedly. On September 3, 1918, I found the patient in excellent general health with negative findings in the pelvis.

The cyst's rapid origin with rapid recurrence and extensive growth is of interest. The evident loss of malignancy of the remnants of cyst wall left on the rectum, due undoubtedly to the radium application, is also of importance. The recurrence was not from implantation, but from direct extension of the portion of broad ligament left at operation.

INTESTINAL OBSTRUCTION FOLLOWING GILLIAM OPERATION.

As you are all well aware, the claim has frequently been made that the loop of round ligament drawn through the abdominal wall in the Gilliam operation can in no way interfere with the intestinal function because there is no ring formed sufficiently narrow to detain a bowel loop that might slip in, and because the location of the slings is in the pelvis. Gilliam, in a discussion of the operation written not so long ago, claimed that no case of intestinal interference had been reported. That there is at least a theoretical possibility of trouble is emphasized by the modifications devised by other men, as, for instance, Montgomery, to prevent such a happening.

Mrs. O. J. had a Gilliam operation done by one of the recognized gynecologists of the East with much benefit to her general and pelvic symptoms. Within some months, however, she was having severe attacks of constipation which unaccountably disappeared for varying periods. The intervals of relief rapidly decreased and the constipation became more severe and harder to control.

When she came under my care she was in the habit of obtaining evacuation of the bowels with the use of the Cascade syringe. A large quantity of water under considerable pressure produced what she described as a "slipping of something inside" and an evacuation would follow. However, the pressure used was continually being augmented, and sometimes no results were obtained for days. The *x*-ray plates showed as in the prints presented.

Some weeks later, after a week of inaction of the bowels, despite all treatment, I operated. The round ligaments presented as

single cords passing to the abdominal wall from the mid-broad ligament edge. The mobile cecum had passed to the right side of the right cord, then to the mid sling. The elongated sigmoid had done the same on the left side. The cords were removed and, as the uterus showed no tendency to retrovert, nothing further was done. For sometime later we had to deal with a torpid bowel because of the redundancy produced by the distentions, due to rather large doses of laxatives.

Fig. 1.—Obstruction following Gilliam operation. *X*-ray, enema.

THREE TUBAL CONCEPTIONS IN ONE WOMAN.

It has been my experience that two out of every three cases of extrauterine pregnancy have been of Japanese nationality. Two of our Japanese physicians explain the condition as due to the prevalence of gonorrheal infection. Recently a case in my practice gave us a tube unruptured with a definite amniotic sac, and another case a tube showing a healing process of four months' duration. The material in both cases was immediately and excellently fixed. Dr. Evans of the University of California (Anatomy Department) is having this material prepared, and next year I hope to be able to

present with him some histologic evidence that may have important bearing on the diverticulum theory of the causation of tubal conception.

In December, 1916, Mrs. Y., a Japanese patient, came to my office giving a typical history of an extrauterine pregnancy that had evidently undergone partial abortion ten days earlier. The clinical symptoms were absolutely pathognomonic—the two weeks overtime; the sharp pain in the right side, faintness, and beginning uterine flow. She had consulted no physician during the acute symptoms.

FIG. 2.—Obstruction following Gilliam operation. 6-hour *x*-ray.

Examination showed an enlarged tube, hard and tender on the right side, a temperature of one degree exacerbation, and some grumous discharge from a normal-sized uterus. As the patient was adverse to operation and the danger of further bleeding had evidently disappeared, we watched her for some weeks while the pathology gradually subsided.

In December, 1917, Mrs. Y. had an attack of similar character; but devoid of the pain and faintness. A Japanese physician curetted the uterus with a resulting aggravation of the pain and soreness in the left side. I was called a week later and, at operation, resected

the left tube which contained the remnants of a partially aborted ampullar conception. The right tube was closed by adhesions from conception of a year ago. These adhesions were freed. The conservation operation on both tubes I did because of the woman's great desire for a child.

In March of 1918, the patient came directly to me complaining of pain and soreness in the right side. She had gone two weeks overtime and now had some slight uterine bleeding. The diagnosis of right tubal conception with probable termination by partial abortion and a hope for a resolution of the mass, delayed operation

FIG. 3.—Obstruction following Gilliam operation. 24-hour *x*-ray.

some weeks, but the increased size of the mass with more soreness and a moderate temperature, resulted in operation. The findings in the right tube were as suspected, but the stump of the left tube had become occluded. A removal of both tube remnants was done.

I am becoming more and more convinced that extrauterine pregnancies are of much more frequent occurrence than we are usually led to believe. I feel certain that a large percentage of these conceptions are never recognized but go on to resolution. And also that many of our pelvic abscesses have as their causation an extrauterine conception.

The cases reported next showing the rapid tubal involution bear out these beliefs largely, I feel.

TWO CASES ILLUSTRATING RAPIDITY OF TUBAL REGENERATION.

It is a well-recognized fact that the inflamed or injured Fallopian tube has marked regenerative powers. Every gynecologist of any experience has seen cases of acute double pyosalpinx undergo such resolution so as to permit of normal pregnancy. When such results are possible it is easy to understand how the tube injured by an extra-uterine conception can return to normal. On the speed of such recuperation we have little data. The two cases here reported are of interest in showing how extremely rapid may be the return to normal.

CASE I.—Mrs. J. C., aged twenty-five, had been married six months. Her menstrual history was normal until the last period which should have occurred two weeks ago. The breasts, she noticed, were somewhat tender and enlarged, and a tendency to nausea in the mornings was present. Upon walking to the street car one afternoon, she was seized with a sudden stabbing pain in in the left ovarian region, and was faint and dizzy. She was compelled to sit on the curb for some time before returning home. She then noticed some bleeding from the uterus. Being a nurse and suspecting a possible disturbance of her pregnancy, she remained in bed for three days but without calling any physician. The soreness in the side, with the continued bleeding and slight temperature, alarmed her, and when I saw her she had very definite tenderness and rigidity in the left inguinal region. The uterus was only slightly enlarged, but a soft baggy mass was felt on the left side. A grumous, scanty discharge came from the uterus.

Operation was delayed, and was undertaken some days later because of continued soreness and pain on the left side. The findings at operation were in a way disappointing since the left tube presented practically a normal appearance except for some congestion and numerous web-like adhesions surrounding its ostium for some inches. The right appendages were normal with an only slightly enlarged uterus. The appendix was removed. The uterine curettage showed no gross fetal elements. That a pregnancy had occurred was undoubtedly true since the breast changes and the presence of lacteal fluid were definite.

CASE II.—Mrs. T., a Japanese, who had had two children, had missed her last period, and was two weeks overtime. She was feeling perfectly well, when at noon time, while bending over the wash tub she was suddenly seized by a very severe pain in the right ovarian region and almost fainted. She returned home and called her Japanese physician toward evening because of the increased weakness and chilliness. His diagnosis was a ruptured tubal pregnancy. I was called by him a few hours later and concurred in the findings. The patient's pulse and color had improved so definitely, and she was so anxious to remain home until morning

that I consented, provided I was notified should any change occur. A few hours before her removal to the hospital in the morning, her pain recurred and the pulse rate increased. The lower abdomen was distended and tender.

The operation, thus done within twenty hours of the onset of symptoms, showed a large amount of blood in the abdominal cavity, but a perfectly normal pelvis, except for the right tube which was devoid of adhesions and appeared normal in every respect, except that it was torn completely across in the middle and was bleeding freely from both ends.

We realize that in the majority of tubal conceptions nature at once begins a process of protection by laying down a blood clot around the fetal elements. As the process of growth and repair continues, the result is a mass consisting of concentric layers of blood clot penetrated by chorionic elements, but seldom containing any definite fetus or amniotic cavity. Such a blood clot mass is what is found at most operations. Unless completely extruded from the tube, it will naturally delay the restitution of the injured oviduct, and because of its density and slow absorption rather favors infection. These are the cases most often recognized by the general practitioner from physical examination because of the presence of the palpable mass, and the more time that has elapsed since the termination of the process, as indicated by the symptoms of rupture or abortion, the firmer and more definite the clotted mass.

The diagnosis of the cases here reported rested wholly upon the history and clinical symptoms, as no definite pathology was palpable pelvicly, and if the symptoms had subsided in the one case, or bleeding ceased in the other, they would, probably, never have come under a physician's care. A careful study of our pelvic operative findings will, I am sure, lead us to the conclusion that a larger portion than we suspect of our pelvic pathologies are due to unrecognized terminated tubal conceptions. Many cases that have been laid at the door of gonorrheal infection may be end-results of extra-uterine pregnancies; though in the last analysis, I believe we will find that mild degrees of tubal infections are at the base of such conceptions rather than the present diverticular theory so generally accepted.

REPORT OF A CASE OF ABLATIO PLACENTÆ.

BY

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I DESIRE to present and to record the following typical case of a rather unusual condition.

Mrs. H. H., aged twenty-three, the mother of one child, had passed through an uneventful pregnancy and was expecting to go into labor. She was in excellent general condition, and the urine on examination was normal. On August 18, 1916, at 5 P. M. she called her physician by telephone, said that her time was up, and asked him to be ready, as she was having indefinite pains which might indicate beginning labor. At 6.30 P. M., an hour and a half later, the husband called the physician and said that the wife, after a moderate amount of abdominal pain, had fainted. He asked the physician to come at once, as he was alarmed. On his arrival the doctor found the patient pale and pulseless, with a damp skin, suffering from air hunger, and with all the signs of extreme hemorrhage. She was complaining of only moderate pain.

The abdominal examination showed the uterus very large and hard. It was apparently greatly distended and in tonic contraction. There was no tenderness, and the organ could be very distinctly made out through the thin, soft abdominal walls. There was no dulness in the flanks. Vaginal examination showed no discharge, either bloody or serous. The cervix was soft and unobliterated, and would not admit one finger. The patient's pulse at first could not be made out. Later it could be counted, but was very weak and variable. It improved but little in the hour or more necessary for her removal to the hospital. The patient had felt life as late as 5 P. M., but had not noticed it since going into shock. The child's heart could not be heard. A diagnosis was made of premature separation of the placenta with concealed hemorrhage into the uterus.

As the patient was in bad condition and not improving, it was considered necessary to deliver her at once with the least possible hemorrhage and shock. A Cesarean section was decided upon and carried out through a high incision. The uterus was incised, the membranes were ruptured, and a dead child delivered from a sac which contained the full amount of amniotic fluid. The child's head was tightly wedged in the pelvis in the L. O. A. position. As soon as the child was delivered, the placenta and the membranes, entirely separated, were rather forcibly extruded from the uterus by the pressure of an enormous amount of fluid blood and clots. Further bleeding was controlled by holding the vessels. The uterus contracted rather slowly but satisfactorily. The patient's condition was very critical, but she improved rapidly when returned to bed. A few days following the operation the hemoglobin was 25 per cent. Fourteen days later she left the hospital with a hemoglobin of 40 per cent., and in good general condition.

REPORT OF AN INSTANCE OF THE DISCHARGE OF SOAP FROM THE GALL-BLADDER.

BY

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The patient was a chronic invalid with many gastric symptoms and with a distended gall-bladder that was both tender and sore. The soreness was constant and was referred to the neighborhood of the ensiform cartilage, while the tenderness was located within the increased area of dulness. No history of so-called colic was obtained.

After consultation with Dr. C. A. Frink, the diagnosis of subacute pancreatitis was made and the gall-bladder distention was deemed secondary; but presence or absence of stone was considered to be a question best answered through actual exploration. Though Dr. Frink assisted me in the operation, though we both feared the possibility of pancreatic stone, and though we both made careful search, yet no stone was found. A rubber drainage tube ½ inch in diameter was fastened in place with silk because we both thought that prolonged and thorough drainage was necessary to meet all the indications.

We could not, and did not, foresee the immediate and unusual improvement that occurred. Operation was completed and the patient was put to bed exactly at twelve o'clock noon. She had gone on the table in rather a bad condition and, as may be readily understood, the operation had not improved matters. Five hours later the patient's condition was described by the nurse as "blooming." A change for the better had taken place comparable to passing through a favorable crisis, and toxemia had given place to recuperation. There had been a discharge through the tube of 75 ounces of dark, thick, almost black, mucous-laden bile, after which the improvement in the patient's condition was so general and so constant that anxiety ceased.

At the time of operation the gall-bladder was dark purple in color as though gangrene were impending, though not yet present. The specimen presented represents an amount of fat-cholesterin soap that was discharged at one time. The whole or total amount discharged altogether would easily be more than twice as much as is here shown. About this soap-form the opinions may be divided into three groups, according to the point of view. All that the present writer asserts is that he can find no reference in literature to the passage of a soap contained in a gall-bladder, through either drainage tube or fistula. Yet here is a specimen that did pass through such a tube; and when that tube was removed, this patient passed other pieces of soap through the tract or fistula.

The physiologists assert that bile contains 2 per cent. of fats and soaps and that bile is like a soap solution in bearing a certain relation to an aqueous fluid and to a fat, at the same time. Therefore, had a smaller tube been employed, this soap would not have passed out of the gall-bladder but would have remained and would have been dissolved as were its predecessors.

The pathologists hold that these soap-forms are not rare, that they are common but "unobserved," and that they are thrown away in the dressings; with much more to the effect that liver, pancreas, and gall-bladder are working all the time, whether there is a biliary fistula or not. Therefore, they ask, why should not the gall-bladder contain soap, and that in rather large quantities under certain conditions of the pancreatic flow, together with an abundance of fat and fatty acids to be emulsified?

The surgeons declare that they have never seen anything like this specimen, in the locality where it was found, that they could not fail to observe it, that they never would pass over such a form without investigation, and that they do not throw away such things in discarded dressings, but collect cholecystostomy drainage in a bottle or jar.

PAINLESS CHILDBIRTH AND THE SAFE CONDUCT OF LABOR.

BY

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THE controversies over the advantages and disadvantages of the various means of rendering child-bearing painless have spread the erroneous belief that child-bearing is naturally associated with excessive pain, which those who are enthusiastic followers of one or the other method of assuaging pain, relieve in every single case; while those who are not blind followers of any one specific method, leave their patients to suffer untold agonies.

The truth is that every qualified obstetrician has the means at his command to make child-bearing safe andpractically free from suffering, provided he can deliver his patients in suitable surroundings, provided that he has fairly good help in the way of assistants and nurses; provided also that he or a competent assistant remain with the parturient woman from the time she goes into labor, till an hour or two after delivery, and provided, further, that expectant mothers place themselves under his care early during the period of expectancy, so that they may receive proper prenatal attention and may enable the obstetrician to prevent many of the complications of child-bearing, and that they give him the chance of selecting the time, the place, and the mode of delivery for abnormal cases.

The doctor who practises obstetrics under such ideal conditions, will have no difficulty in making his patients comfortable, no matter which anesthetics or which drugs he uses; in fact, he will find that many of his patients, knowing that they are surrounded by all the safeguards which modern obstetrics provides, and knowing that there is a competent obstetrician at their bedside, will complain very little of pain, except perhaps at the very end of the second stage. Many multiparæ and not a few primiparæ will not complain even then, so that the administration of anesthetics in these cases is not only unnecessary, but directly harmful.

The trouble is that 90 per cent. of the child-bearing women in the United States are not delivered under such ideal conditions; that most of them receive no prenatal care whatever; that a large percentage is not attended by qualified obstetricians, and that the

obstetrician, when called, finds himself handicapped by the lack of facilities and competent help.

Under such circumstances a majority of our women must continue to suffer intensely in body and mind during the crowning event of their lives, that of becoming mothers. This suffering, unnecessary and deplorable as it is, constitutes but the smallest part of the crime against the mothers of our great nation. Thousands of women die every year from the effects of confinement, most of these from infection which is absolutely preventable; tens of thousands become invalids from the same cause; of the babies, many tens of thousands die during or immediately after birth; other tens of thousands are ruined for life and later on fill the institutions for the blind, the epileptic, or the feeble-minded.

In judging the relative value of various means employed to relieve the pain of labor, it seems advisable to select a series of cases which has been attended under fairly even conditions as to surroundings and obstetrical qualifications of the attending physician.

For this reason the writer has selected a series of 1000 cases, namely, the first thousand cases delivered on the obstetrical service of Barnes Hospital, which was opened in December, 1914. This service is conducted by the Department of Obstetrics and Gynecology of the Washington University School of Medicine.

The cases were delivered by the writer or by the two instructors on the service, Dr. Grandison Royston and Dr. Otto H. Schwarz, or by members of the house staff and senior students under our supervision.

The house staff, until July 1, 1918, consisted of a resident, two assistant residents, and three house officers; instructors, residents, and assistant residents have grown up in the department, a fact which insures uniformity of service, and uniformity in the keeping of records.

The cases comprise all ward and all private patients. Both receive the same care.

The number of obstetrical cases is relatively small, but is steadily increasing. In 1915, it was less than 200; in 1918, it will be more than 400. The department conducts a fair-sized obstetrical polyclinic, delivering the women in their homes, but sending all complicated cases to the hospital, where a sufficient number of free beds is always available. These cases all receive prenatal care; medical practitioners, likewise, send a large number of abnormal cases to the hospital and turn them over to the staff.

It is hardly necessary to emphasize that we practise strict asepsis, but it should be mentioned that we are quite free with vaginal examinations; we have had no cases of infection on that account.

We manage, except in rare cases, to deliver without high forceps or forceps in midpelvis; but the writer has always taught and always practised the application of the forceps in primiparæ, when the head is on the perineum and completely rotated; and, likewise, in multiparæ under the same conditions, when there is any considerable delay.

In primiparæ, by the time the head is appearing in the vulva, the latter has usually reached the greatest degree of elasticity and the application of the forceps under these conditions really constitutes a means of protecting the perineum, especially when accompanied by single or double episiotomy. By this practice we prevent injury to the pelvic floor in most cases; the incisions usually heal by first intention.

This mode of using the forceps hardly deserves the name of forceps delivery, especially since we usually remove the instrument before the head is completely born. It represents simply a lifting of the head over the perineum, and is the only application of the forceps which the writer encourages members of his staff to make.

This practice accounts for the many episiotomies and low forceps deliveries in this service, namely, 45 per cent. of episiotomies and 64 per cent. of low forceps in primiparæ, and 8 per cent. of episiotomies and 20 per cent. of low forceps in multiparæ. Women who have had miscarriages are classed on the hospital records as multiparæ, although their vulvar ring is practically in primiparous condition; hence the 8 per cent. of episiotomies in multiparæ.

The anesthetics and analgesics employed in these 1000 cases were chloroform, ether, nitrous oxid and scopolamine. Morphine and narcophine were used only as adjuvants except in a few cases in which they may have been used to meet special indications. Chloral hydrate was used in a few eclamptic cases only. Ethyl chloride, in the form of somnoform, was used by itself in only four cases; but it was used in a large number of cases in connection with the scopolamine-narcophine method.

All cases are classified under the head of the principal anesthetic or analgesic used. It must be understood, however, that nitrous oxid and scopolamine are usually supplemented at the end of the second stage of labor by chloroform or ether.

Chloroform, ether, nitrous oxid and scopolamine should be employed only when the obstetrician is in constant attendance at the

bedside, as each of these four agents has its special sphere of usefulness. In seeking to give relief from pain, it is often desirable and at times indispensable to use several of these agents in succession or in combination. Nitrous oxid and scopolamine are comparatively harmless for mother and child; chloroform and ether are not quite so harmless for the mother, and they are distinctly dangerous for the child; the same statement applies to morphine. The objection so often raised that the employment of any of these agents may prolong the second stage of labor or may cause postpartum hemorrhage, does not apply to cases attended by qualified obstetricians.

The judicious use of pituitary preparations before delivery and of preparations of ergot after delivery make it possible to regulate the uterine contractions during delivery, and to prevent postpartum relaxation of the uterus, it is especially helpful in cases of multiparæ of relaxed habit, in whom formerly we were justly apprehensive of hemorrhage, and consequently afraid of administering anesthetics and narcotics.

In looking over the records of the 1000 cases under consideration, we find that twelve primiparæ and ninety-one multiparæ, that is, 103 cases or 10 per cent., received no anesthetic of any kind. These women were not allowed to suffer; they simply did not feel sufficient pain to justify the administration of anesthetics.

In this group of cases, seven children were stillborn and one died soon after delivery; that is, eight dead babies or 8 per cent. of dead babies in a group of mothers who had received no anesthetics of any kind. Included are several cases of congenital syphilis and some premature deliveries.

Chloroform exclusively was given in 377 or 37.7 per cent. of all cases; of these 115 were primiparæ and 262 were multiparæ. Chloroform, from its introduction to the present day, is the obstetrical anesthetic par excellence; no general practitioner could do without it, and every hospital service, however well supplied with other means for relieving pain, should have it at hand. Chloroform is easily carried in the obstetrical satchel; it is always ready for instant use; it gives immediate relief, and the parturient woman is peculiarly immune against its after-effects. Every doctor knows that the woman who will be nauseated for a day or two from chloroform narcosis administered during some minor operation, will be able to take and retain a nasty dose of ergot, and to eat and drink as soon as she recovers consciousness from a much deeper and more prolonged chloroform narcosis during a difficult delivery.

Of course, since it has been demonstrated that chloroform may

cause the same necrotic changes in the liver that are observed in toxemia, we have given up its use in these cases. Opie has shown that, if two noxious agents cause necrotic changes in the liver, a combination of such two agents will cause a greater amount of destruction than would the same quantity of either agent alone. This fact is an added reason for not using chloroform in toxemias.

Opie's work, which was done on dogs, showed another very important result. In some of the dogs the entire liver was found to be necrotic, as was shown by sections removed by laparotomy; but the animals recovered, and later examination showed that the liver had been completely restored. This discovery explains the observation all older obstetricians have made in eclamptic patients who were kept under chloroform for long periods, who had twenty or thirty or more convulsions, who remained comatose for several days, and who finally made a complete recovery.

It is possible to render labor painless from beginning to end by giving chloroform *à la reine;* but it is a more difficult and a more tedious task than to secure the same end by other means. Most women, the moment they are given ever so little chloroform, lose self-control and can no longer be managed, except by the more or less continuous use of the anesthetic.

In former years, in private practice, the writer often gave chloroform *à la reine.* More often the patient was given a few drops of chloroform during a pain as long as she was bearing down; though when she bore down, she could not inhale, and consequently did not get any chloroform worth mentioning. Chloroform is very commonly employed during actual delivery after nitrous oxid or scopolamine analgesia; but in cases of this kind it usually takes no more than 20 or 30 drops of chloroform to reach surgical anesthesia.

Effect of Chloroform on the Fetus.—Of all anesthetics and analgesics, chloroform is the most dangerous to fetal life. It is a common experience to find a new-born infant so deeply under the influence of chloroform as to require prolonged artificial respiration. Chloroform forms less ephemeral combination with the blood than does nitrous oxid, and it requires a longer period for its elimination.

Some of the stillborn and asphyxiated infants attributed to nitrous oxid or to scopolamine, are no doubt due to the incautious use of chloroform in connection with these agents.

Eleven babies were stillborn under chloroform and nine were so deeply asphyxiated as to require artificial respiration. Of these latter cases six died within a few days after delivery, bringing the total number of dead babies in this class up to seventeen, or to 4.5 per cent.

Among the seventeen dead babies were two macerated from mothers with 4+ Wassermann reaction; one case of hydrocephalus with craniotomy; two cases of placenta previa delivered around the thirtieth week; one case delivered at twenty-seven weeks, and one case of high forceps delivery in a contracted pelvis, which entered the hospital after being in labor twenty-four hours and after frequent examinations.

Ether, exclusively, was given to fifty-four cases, of which twenty-five were primiparæ and twenty-nine were multiparæ, that is, to about 5 per cent. of all cases. These were mostly cases of toxemia and eclampsia. Ether, in combination with nitrous oxid or with scopolamine, was used to some extent, but not one-fifth as often as chloroform. Ether is comparatively safe for the mother, but not so pleasant to take, and not so easy to recover from as chloroform; hence its exclusive use was restricted to cases in which chloroform seemed contraindicated. The effect of ether on the fetus is very similar to the effect of chloroform. It is not unusual to have a baby born evidently under the influence of ether (ether-jag) and requiring artificial respiration and prolonged watching.

Of the babies, seven were stillborn, two were deeply asphyxiated and died within a few days after delivery, bringing the total number of dead babies in this group to nine, or 16.6 per cent. The higher mortality in the ether-group finds its explanation in the abnormal character of the cases selected for this anesthetic. There were also one case of craniotomy of a dead child and one case of decapitation of a dead-locked twin in this group.

Nitrous oxid-oxygen analgesia was used in sixty-nine cases only. We have used nitrous oxid-oxygen anesthesia in the operating room for many years and in certain obstetrical cases at all times, usually with ether sequence; but we were until recently unacquainted with the Klikowitsch method of producing analgesia. Since October, 1917, we have been using nitrous oxid-oxygen analgesia in increasing numbers of cases, and we consider it the safest and one of the most effective means of abolishing a certain percentage of the pain and anguish of child-bearing.

The history of this form of analgesia is interesting. It was first practised in Petrograd in 1880, by Klikowitsch, who published his experience in 1881 and was then taken up by Winkel and by Doederlein, who convinced themselves of the effectiveness and absolute safety of the method. For various reasons, the time had not come for its general adoption, and it seems to have been completely forgotten.

In 1914 it was again employed by Dr. Junius Hoag and Dr. Frank P. Lynch, because Mr. Clark, a maker of instruments for anesthesia, insisted that they use this method on his daughter. Neither Mr. Clark nor Drs. Hoag and Lynch were at that time acquainted with the work of Klikowitsch; the method is, therefore, original with these three men. A year later this work was taken up by Dr. Webster and his associates at the Presbyterian Hospital, and to this group of Chicago physicians we are indebted for cultivating and popularizing this method and for bringing it conspicuously to the attention of the medical profession.

This form of analgesia is particularly suited for multiparous women, and is absolutely devoid of danger for mother or child. It requires the constant bedside attendance of the obstetrician, even more than does twilight sleep. At the oncoming of each pain the patient is requested to take from four to six deep inhalations, and the gas is then shut off before the uterine contraction has reached its height. The analgesia lasts long enough to render the patient insensible to the greater part of the pain, while the fact that she herself plays an active part in subduing the pain, and that she remains conscious at all times, adds greatly to her comfort and satisfaction. At the end of the second stage of labor, the analgesia can readily be deepened to anesthesia by the constant breathing of nitrous oxid-oxygen. If no ether is used for intensifying the anesthesia, the patient will recover complete consciousness before she can be removed from the delivery room. Nitrous oxid does not enter into chemical combination with the tissues, as do chloroform or ether. Its elimination is almost instantaneous as soon as the administration is stopped, and thus there is absolutely no danger of asphyxiated babies from this source.

Nitrous oxid-oxygen has no inhibitory influence on uterine contractions; in some cases, in fact, it seems to intensify them.

The use of nitrous oxid is contraindicated in cases of valvular disease of the heart, high blood pressure, and in very feeble persons.

The expense for gas is not great if used for analgesia alone, as the portable gas machines make it possible for the practitioner to apply the method in the patient's home, and even to have the patient administer the gas herself under his instruction and in his presence.

In our delivery rooms we have been using the portable machines to impress the students that the method can be used in private homes; we have also used the larger machines of the type used in the operating pavilion. We derive the greatest satisfaction from the use of a large dental machine, which has a separate bag for the

nitrous oxid and for the oxygen, and has an arrangement by which instant and noiseless changes are made from pure nitrous oxid to pure oxygen, or to any percentage of oxygen desired.

On the gynecological service on which nitrous oxid-oxygen anesthesia has been used for years, the expense for gas is quite considerable, and any device which will reduce the amount of gas used is welcome.

D. E. Jackson has perfected a machine by which the anesthetic (nitrous oxid, ether, ethyl chloride, etc.) is constantly rebreathed over and over again, while the carbon dioxid exhaled by the patient is constantly and completely removed from the respired gases or vapors, by passing them through a tank filled with sodium hydrate. We have used this machine since December, 1917, and find that it saves over 50 per cent. of the expense, besides avoiding the bad features of ordinary rebreathing.

Of sixty-nine babies delivered under nitrous oxid-oxygen analgesia four were stillborn and one was asphyxiated, but recovered. This result gives a fetal mortality of 6 per cent. in these cases. Among them was one case of narrow pelvis with prolapse of the cord and an 11-pound child; one case of contracted pelvis and podalic version, and one case of anencephalus.

Scopolamine-narcophine seminarcosis was used in 393 cases; of the babies fifteen were stillborn, and thirteen asphyxiated so as to need artificial respiration. Of the asphyxiated babies three died before the mothers left the hospital, bringing the number of dead babies in this group up to eighteen, or to 4.6 per cent. Among these stillborn babies were one case of hydrocephalus; one case of anencephalus with spina bifida; one 11-pound brow-presentation with meningocele; one craniotomy of the dead child in a narrow pelvis; one child with congenital syphilis, and five cases brought to the hospital after protracted labor, in two of which the fetal heart beat could no longer be heard, and all five of which required instrumental delivery on account of the mechanical disproportion between the pelvis and the fetal head.

The investigation and the employment of the Gauss method was taken up by the writer and his associates just as soon as the Medical School had moved into its new quarters. The newspaper and magazine propaganda and controversies for and about twilight sleep were at their height, and it seemed a public duty for an institution such as ours to make a thorough investigation of a question in which the women of America are so intensely and so vitally interested.

The perusal of the original publication of Gauss in 1906 dem-

onstrated the fact that in his initial series of 500 cases he had encountered and carefully recorded most of the difficulties and most of the objectionable features about which many who took up this method of relieving the pain of child-bearing, complained, and that he had overcome and avoided these difficulties and by-effects in his later series of cases. This is particularly true of the administration of morphine, which Gauss held responsible for the delayed respiration in some twilight-babies, and which he restricts to 1/6 grain, to be given once and once only with the initial dose of scopolamine.

To the writer it seemed advisable that he and those who are associated with him should make themselves fully familiar by animal experiment with the effects of the various opium alkaloids and of scopolamine or hyoscine on heart and respiration, before employing these powerful drugs in a routine clinical method.

These experiments were made by Doctor Otto H. Schwarz in the pharmacological laboratories of the Medical School under the guidance and constant supervision of Professor Dennis E. Jackson. The experiments proved to our satisfaction that scopolamine in doses much larger than were ever recommended for twilight-sleep has no material effect on blood pressure or on respiration.

The paralyzing action of scopolamine on peripheral nerve-endings was illustrated by its action on the endings of the vagi in the bronchioles, its action on their inhibitory terminals in the heart and its action on the terminals of the third nerve in the iris.

Experiments on spinal dogs with morphine, narcotine, and narcophine, showed that these alkaloids act directly on the muscle fibers of the bronchioles, causing broncho-constriction. This action was most pronounced in morphine, less so in narcotine, and least in narcophine.

The interference of these opium alkaloids with the respiration of the new-born child is, therefore, twofold. In the first place, the respiratory center is depressed so that it requires a greater degree of stimulation to be set in motion; in the second place, there is bronchoconstriction, which means that the pipes leading to the air cells of the lungs are reduced in diameter and give passage to only part of the usual volume of air. The resuscitation of a new-born child, when there is bronchoconstriction coexisting with depression of the respiratory center, is more difficult than in ordinary cases of asphyxia.

The drugs employed by us for the clinical application of the Gauss method of analgesia are principally the scopolamine stable

"Roche" and narcophine; in a few cases hyoscine in tablet form has been used with equal success. At present, hyoscine in ampule form is being used in a series of cases and is giving satisfaction, after an older liquid preparation of the same firm had been found to be inert.

Gauss in 1906 called attention to the fact that little difference exists in the preparations of scopolamine obtained from various reliable firms. He had, among other preparations, used Burroughs, Welcome & Co.'s tablets, and it was simply for the sake of convenience that later on he limited himself to the scopolamine-Merck. He pointed out, likewise, that the difference in reacting to the drug is to be sought more in an individual disposition of the patient, than in a difference in the various preparations of scopolamine or hyoscine.

These remarks were made in regard to dry preparations. In dealing with solutions of scopolamine, however, the writer's experience seems to point out that with the exception of the scopolamine stable "Roche," solutions of this drug in ampule form are not very stable, and comparatively fresh preparations must be used to insure success.

The advantage of narcophine over morphine is not as great as it might appear at first sight. While morphine undoubtedly has the more harmful influence on fetal respiration, narcophine is administered in dosis three times larger, and thus the advantage is in great measure lost. We use narcophine in ½-grain dosis or morphine in ⅙ grain dosis.

In the beginning we followed the Freiburg method as closely as we were able and obtained average results; that is to say, we obtained amnesia and otherwise perfect results in about 80 per cent. of cases. The remaining cases developed more or less analgesia, but no loss of memory concerning what they had passed through, and now and then we met a case in which scopolamine greatly excited the patient and had to be stopped. A number of babies were born in a state of apnea or oligopnea, lasting from one to ten minutes, but requiring no artificial respiration.

When an injection of scopolamine had been made within a short time before the baby was born, the baby's skin at times would show large patches of a peculiar bluish-red discoloration, which, however, soon disappeared.

After carefully observing and recording the first series of fifty cases, our present method of administering twilight had been developed, and it continues to give perfect satisfaction.

We use twilight practically as a first-stage measure only. As soon as the parturient woman has strong uterine contractions, re-

turning at regular intervals and beginning dilatation of the external os uteri, she is prepared for delivery and taken to one of the delivery rooms. Her ears are stuffed with cotton soaked in olive oil to keep out as much sound as possible, and her eyes are covered with little pads of gauze held in position by strips of adhesive plaster to protect them against bright light.

The initial dose of scopolamine is $\frac{1}{133}$ grain or 1.5 c.c. of scopolamine stable for an average woman of from 120 to 150 pounds of weight; for smaller women, only 1 c.c. or $\frac{1}{200}$ grain is used, while for larger and heavier women 2 c.c. or $\frac{1}{100}$ grain may be used. With this first injection, separately or combined, is given $\frac{1}{2}$ grain of narcophine or $\frac{1}{6}$ grain of morphine.

These injections are given subcutaneously. This procedure is very important, as it is not desirable to get the scopolamine to act quickly. On the contrary, one wishes it to take possession of the patient very slowly. The dosis of scopolamine is deposited in a pocket under the skin, so to speak, and its absorption takes place gradually, the more slowly, the better. This first injection usually causes dryness of mouth and throat, manifested by thirst and a flushed condition of the face; the patient is encouraged to drink water freely at this stage.

The second injection is usually given forty-five minutes after the first one. When the time for this injection approaches, the patient is prepared for a vaginal examination to ascertain the degree of dilatation, and this procedure is repeated before every subsequent injection. If at any time it is found that dilatation is complete, or nearly so, all injections of scopolamine are stopped, as it is not desirable to give scopolamine during the second stage of labor. If the cases are properly selected, one is usually able to give at least three injections before dilatation is so far advanced as to contraindicate the further administration of scopolamine. The second injection, as a rule, is as large as the first one; that is to say, $\frac{1}{133}$ grain for an average woman; the narcophine or morphine is never repeated after the first injection.

The memory test we have abolished. We test the degree to which our patients are under the influence of scopolamine by a very simple and, at the same time, very accurate method. Before the second injection, and before each contemplated subsequent injection, the patient is requested to put her index-finger on the tip of her nose, while her eyes remain covered. If she succeeds in doing this promptly, she still retains locomotor coördination, and the contemplated injection is given; if, however, she moves her finger around

vaguely and misses the mark, she has lost locomotor coördination, and the injection is omitted, or the dosis is reduced, for the patient has the desirable amount of scopolamine. In most cases this stage is reached about ten minutes after the third injection. The third injection is usually given forty-five minutes after the second one. If the patient at this time shows signs of going under the influence of the scopolamine, such as drowsiness or sleeping between labor pains, but still manifests locomotor coördination, the third injection consists of $\frac{1}{200}$ grain or less for an average woman. If no such signs are present, the original dosis of $\frac{1}{133}$ grain is repeated.

After the third injection most patients remain sufficiently scopolaminized for two hours or longer. At the expiration of this period, complete dilatation of the cervix uteri has usually taken place, and further injections are unnecessary or harmful. The first stage of labor is over or nearly so, and the time is close at hand at which the seminarcosis should be deepened to complete anesthesia by the administration of a little chloroform or some other general anesthetic.

There are, however, numerous cases in which the first stage of labor is protracted for many hours, and even for a day or two. This condition is especially true of some primiparous women in whom the membranes have ruptured before the onset of labor, and of some multiparous women, on whom thorough repair of cervical lacerations together with fixation of the uterus forward by some abdominal method has been performed.

Some of these women suffer intensely and for many hours during the first stage of labor until dilatation is at last complete, and final delivery is possible and usually easy enough.

The writer knows of no method by which this class of women and the members of their family can be kept comfortable and under perfect control during these long and painful hours of the first stage, which can be at all compared with twilight sleep. It is in these cases that the scopolamine method has proved itself the greatest blessing; it is in these cases, likewise, that the administration of the drug must be watched most carefully. The amount of scopolamine given and the time of making injections depends entirely upon the degree to which the patient appears to be under the influence of the drug.

The administration of the drug should be continued until the patient has lost locomotor coördination; and when this stage is reached, it should be continued in small and infrequent doses to keep the patient in this desirable condition.

The loss of locomotor coördination marks the one boundary of

twilight sleep; the patient must cross this boundary which should be labeled "just enough," and she must be kept from crossing the other boundary, which should be labeled "too much." This other boundary is reached when, during a labor pain, the patient's pupils no longer show the usual dilatation at the height of a labor pain, because they are already dilated at maximum by the action of the scopolamine on the terminals of the third nerve in the iris.

These are the two boundaries which we watch by frequent tests during the administration of scopolamine for twilight sleep. We test for the presence or absence of locomotor coördination until we know that the patient has crossed the first boundary, and we test the pupils from time to time during a labor pain, to assure us that they are still capable of dilatation, and that the patient has not crossed the second boundary.

Keeping the patient on this narrow strip between these two boundaries, constitutes scientific twilight sleep. All that goes beyond the second boundary is unscientific drugging, and has as little to do with twilight sleep as the ordinary nitrous oxid-oxygen anesthesia has to do with nitrous oxid-oxygen analgesia.

In primiparous women the scopolamine-analgesia is usually intensified to surgical anesthesia by the inhalation of very small quantities of chloroform, just as soon as the head is on the floor of the pelvis and the perineum begins to bulge. Great care is necessary in the administration of chloroform after scopolamine; 10 to 15 drops on a gauze mask are usually sufficient to render the patient completely relaxed and unconscious, so that she sleeps and snores between contractions. The doctors who administer this chloroform must constantly be reminded of these facts, as otherwise they are inclined to use it more liberally; and by so doing, they not only chloroform the mother to a much deeper degree than the occasion demands, but they also chloroform the fetus so deeply that it is bound to be born apneic and to become asphyxiated.

In multiparous women scopolamine is followed by chloroform only in those cases in which final delivery is abnormally painful or complicated. More often a full dose of some potent preparation of the pituitary gland is administered intramuscularly at this stage, partly to expedite the expulsion of the child, and partly to insure good uterine contractions during the third stage of labor.

The employment preparations of scopolamine or hyoscine in connection with a small single dose of narcophine or morphine in the manner described, has proved itself absolutely safe for mother and child. Furthermore, we meet with no failures. In about 80

per cent. of cases the results are perfect; in the majority of the remaining cases the relief from pain is sufficient to keep the mother comfortable until the time for the administration of chloroform has arrived. In the few exceptional cases in which the patient shows an idiosyncrasy against scopolamine, we give up the attempt at once and use chloralhydrate in 30- or 40-grain doses (per rectum, dissolved in 2 ounces of mucilage of gum arabic to prevent irritation) until it is practicable to administer nitrous oxid-oxygen or chloroform. Our sole aim is to reduce the suffering of the child-bearing woman to a minimum by means which are without danger to mother or baby; if in a certain number of cases our method of administering scopolamine does not induce ideal twilight sleep, we hold that it is the part of wisdom to do without amnesia, or to change to some other analgesia or anesthetic rather than to try to force the scopolamine method by giving larger or more frequent doses.

The method can be employed with success in well-appointed homes, provided the obstetrician remains at the bedside throughout delivery, and provided he has at his command skilled assistants and trained nurses. The writer has used it under those circumstances in a considerable number of cases and with perfect satisfaction. It is not likely to be successful in the case of deliveries in apartments or tenements.

It is unreasonable to say that the method cannot be employed successfully by the general practitioner; for if the practitioner is a qualified obstetrician, he can use this method as easily and as successfully as the specialist. If he is not a qualified obstetrician, no method and no parturient woman are safe in his hands.

It is for this reason that we are at present using hyoscine and morphine in a series of cases, although we are well supplied with scopolamine stable and with narcophine. The former are accessible to every practitioner, while the latter may at times be more difficult to secure.

Recapitulation.—Chloroform, ether, nitrous oxid-oxygen, and the so-called twilight sleep are all four highly important means for relieving the pains of child-bearing, for regulating uterine contractions, for preventing or combating puerperal convulsions, and for securing anesthesia for obstetrical manipulations and operations. All have their special indications and contraindications, and each one of them has advantages in certain classes of cases. Twilight sleep is most applicable during the first stage of labor; particularly in primiparous women. When the first stage is unusually protracted and painful, as it is in some cases of premature rupture of the membranes or in

some cases in which repair work has been done on the cervix uteri, the writer knows of no other means equally capable of preventing excessive pain and of accelerating the dilatation of the cervix uteri.

In cases of delivery through the natural passages in women who on a previous occasion have been delivered by abdominal Cesarean section, it is of the greatest importance to prevent all straining on the part of the parturient woman, and to extract the child just as soon as dilatation is completed, so as to keep all strain, as far as possible, from the uterine scar. Here again, twilight sleep is the safest and surest means of aiding dilatation and of preventing straining. Under twilight the patient will strain if the doctor rouses her and asks her to bear down, but she will not do it otherwise; under nitrous oxid-oxygen women usually cannot help bearing down. Among the cases included in the series here reported, are two cases of twilight delivery after Cesarean section. *Obstetrical Number* 1161, April 30, 1915. In 1911 Cesarean section (Clarence Webster) and removal of ovarian cyst. *Obstetrical Number* 1250, October 3, 1915. In 1911 Cesarean section by the writer followed by myomectomy. Both cases were kept under twilight, the one for five hours, the other for twelve hours, and were then delivered by forceps of fine living children, and both made uneventful recoveries. 1250 has been delivered a second time since; again twilight and low forceps; living child and uneventful recovery.

Nitrous oxid-oxygen is best suited for multiparous women and for the second stage. Since we have become familiar with its advantages and absolute safety for mother and child, we use it more often and extend its field. It has the advantage in that it can be used by the practitioner in any kind of home. For this reason we demonstrate the use of the portable machines in our delivery rooms.

Chloroform is as indispensable to the obstetrician as ever.

Ether is necessary for a limited number of cases only, but in these cases we cannot work without it.

Morphine and chloralhydrate are helpful in increasing or accelerating the action of the four principal obstetrical analgesics and anesthetics.

The following tables covering the first 1000 obstetrical cases delivered in Barnes Hospital are submitted to show which anesthetics were used, how many children were born dead or died before leaving the hospital and in how many low forceps were practised.

Of the 1009 children (there were nine twin pregnancies) 960 were vertex, fourty-three breech, five face, and one brow presentation.

Of the mothers, nine died. Among these were several cases of

eclampsia brought to the hospital in desperate condition, and one case of acute yellow atrophy of the liver. In no case had the anesthetic anything to do with the fatal ending. The one doubtful case was that of a woman with a generally contracted pelvis, who had been in labor two days; was brought to the hospital in an exhausted condition; was delivered of a living child by Cesarean section; lost very little blood at the operation and seems to have died from shock. The anesthetic used was ether. The tables are submitted without further comment.

TABULATED RECORD OF ONE THOUSAND CASES OF LABOR DELIVERED AT BARNES HOSPITAL, ST. LOUIS.

Obstetrical Numbers 1085 to 2224 inclusive; Miscarriages and Cases not delivered, excluded.

Paræ	Anesthetic Employed							Children		Mothers	
	Number	Twilight	Chloroform	Nitrous oxid-oxygen	Ether	Somnoform	None	Asphyxiated	Stillborn	Episiotomy	Low forceps
Primiparæ.....	445	265	115	26	25	2	12	11	21	203	292
Multiparæ.....	555	128	262	43	29	2	91	15	23	44	112
Total.....	1000	393	377	69	54	4	103	26	44	247	404

Anesthetic	Number	Condition of children			Total number of dead children	Per cent.
		Asphyxiated	Died before leaving	Still-born		
Twilight.....	393	13	3	15	18	4 58
Chloroform.....	377	9	6	11	17	4.51
Nitrous oxid-oxygen..	69	1	0	4	4	5.80
Ether.....	54	2	2	7	9	16.66
Somnoform.....	4	0	0	0	0	0.00
None.....	103	1	1	7	8	7.76
Total.....	1000	26	12	44	56	5.60

CONCLUSIONS.

Every expectant mother has the right to demand the safe and painless conduct of labor which modern obstetrics makes possible.

Safety for mother and child and the relief from pain must go hand

in hand; both can be attained if adequate obstetric care is furnished to every mother before, during, and after confinement, and in no other way.

As long as ignorance regarding the facts in the case remains so general among the mothers of this country; as long as Christian Scientists and those who complacently point out that their grandmothers and the Indians and the mothers of Central Africa got along without prenatal care and without modern obstetricians, keep the mothers of our own country from seeking the protection of these modern blessings and from securing by united efforts the passage of necessary laws which would make it incumbent upon the communities, the states, or the national Government to make proper provisions for all expectant mothers, rich and poor, alike; just so long will the untold suffering, the waste of thousands of infants' lives, the immeasurable damage to health and mind which fill our hospitals and our institutions for the blind and feeble-minded, continue to go unchecked.

For be it remembered that toxemias, puerperal convulsions, postpartum hemorrhage, ophthalmoblennorrhea and many other complications of pregnancy and labor, are preventable by prenatal care; while other equally serious complications are recognized in good time and are corrected; and be it remembered that the relief from pain, desirable and wonderful as it is, constitutes but a small part of proper obstetrical attendance.

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THE PATHOLOGY OF CHRONIC METRITIS AND CHRONIC SUBINVOLUTION.

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(With fifteen illustrations.)

Chronic metritis and chronic subinvolution are two gynecological conditions which, until recently, have been considerably confused, and only partially understood. The work of Szasz-Schwarz, 1903, describes the changes which occur in the distribution of elastic tissue in the uteri of women who have borne children, and distinguishes the parous uterus from the nulliparous. This work forms the foundation on which all the more recent investigation has been based.

Pankow, 1906, confirmed the work of Szasz-Schwarz; and Goodall, in his work on the involution of the circulatory system of the uterus, 1910, uses their work as a definite basis for his investigations. Shaw, 1914, confirming most of Goodall's findings, used this information to differentiate certain definite types of uteri which had formerly been classed, clinically, under the title of chronic metritis. In a later work, 1917, Shaw places under the head of chronic metritis, three types of uteri: those due to true chronic metritis; those due to hypertrophy; and those due to chronic subinvolution. In this investigation he examined 100 specimens and points out that one, and only one, specimen showed definite signs of true chronic metritis. He modifies his findings by stating that there was considerable overlapping; that many uteri which showed changes due to subinvolution, no doubt, also had some change due to chronic metritis; and that in a very large number of these the subinvolution was due to the presence of inflammation, although it was impossible to say that any of the histological changes were the result of this condition.

The fact that Shaw found so little evidence of chronic inflammation in his specimens, considering that there is so much inflammation of the pelvic connective tissue, endometritis, and salpingitis,

was rather surprising. Further, in studying routine sections in the laboratory, I frequently encountered specimens of uteri which showed definitely a chronic inflammatory reaction throughout the musculature. These facts led me to investigate for myself, in order to confirm or to correct his findings.

To carry out this investigation, 100 uteri which were removed at operation, or at autopsy, were selected; of these seventy-eight only were found suitable for this particular study. Those rejected were uteri which had either small myomata in the wall, or nodules of the subserous variety; a few of the discarded specimens were puerperal uteri. These were all examined, but have not been included in the series. A detailed description of the nature of these specimens and the manner in which they were studied will be given later. As a whole, the group consisted of enlarged uteri which caused either pain, hemorrhage, or leukorrhea, or a combination of these symptoms, and showed no evidence of new growth.

With the exception of this mild criticism, the work of Shaw cannot be praised too highly. In 1907 Shaw published his first paper on the subject and brought out several good points; but in this publication the pathology was not definitely understood. In the articles of 1914 and 1917, in which he used the works of Goodall as a foundation, he clearly differentiates the three above-mentioned types by accurately studying their independent pathology, and definitely placed the subject on a scientific basis.

Pankow, 1906, states, as a result of extensive investigation, that definite alterations were constantly found in the distribution of elastic tissue in the uterus as a whole, and more particularly about the blood-vessels, in women who had borne children; and, as these alterations were never observed in the nulliparous specimens, he feels that these changes are definitely due to one or more pregnancies. The essential findings in the microscopic picture are, in short, a peculiar arrangement, increase, and change of the elastic tissue of the vessel walls, which accompany a general increase of the elastic tissue in the uterine wall.

According to this author, the changes are so characteristic that he, like Szasz-Schwarz, maintains that by these changes alone one may decide whether the uterus is that of a parous or a nulliparous woman. Goodall, referring to these statements, says that it is quite possible for a parous uterus to undergo such extensive involution that the vessel changes have either never appeared, or have, at some later period, become completely absorbed. He looks upon this condition as the exception rather than the rule. In none of my

specimens of multiparous uteri were these changes lacking. To be sure, in some cases they were not strikingly marked, but they were sufficiently distinct to enable one to make a diagnosis of previously existing pregnancy. These lesser changes were present particularly in women who had but one child. Pankow points out that age has no influence on these findings, and that they occur in the uteri of young as well as old women who have borne children.

FIG. 1.—A typical case of chronic subinvolution. Enormous thickening of uterine wall; endometrium also thickened. Myometrium, 30 mm. Marked increase in elastic tissue; muscle tissue hypertrophic. The small whitish projections from the cut enlarged are thickened blood-vessels. Three-fourths actual size. *Gyn. Path.*, No. 695.

Pankow does not know whether these changes occur after early abortion or not, as no specimen of this character had come into his hands; but knowing that similar changes, only less marked, occur in the blood-vessels of the endometrium of females past puberty, he believes that, in cases of abortion, these changes should occur at least in the vessels of the extreme inner part, or of the inner third of the endometrium. As proof that there is considerable truth in this assumption, two examples are here cited: In the first case (*Gyn. Path.*, No. 661) the uterus was removed from a patient

thirty years old, with a history of one pregnancy; gestation was interrupted by a midwife at the end of the third month, nine months before the removal of the uterus. In this specimen three vessels showed, quite definitely, bands of elastic tissue outside the media, a condition which could be readily attributed to previous pregnancy. In the other case (*Gyn. Path.*, No. 130), which will be fully described under the heading "Chronic Metritis," the uterus was that of a

FIG. 2.—Chronic subinvolution. Immense thickening of wall, marked increase in elastic tissue, muscle tissue hypertrophic. Muscle wall measures 30 mm. Three-fourths actual size. *Gyn. Path.*, No. 468.

uniparous woman, aged thirty-three, who miscarried a twenty-four weeks' ovum, six weeks previous to the hysterectomy. In this case one vessel in the inner zone showed definite change by the presence of a thick band of elastic tissue outside the media, encircling half the vessel.

In the series of seventy-eight uteri studied, there were nine specimens of nulliparous uteri. In none of these specimens were there any elastic tissue changes about the blood-vessels, a fact which further substantiates the statement that the changes described by Pankow are unquestionably the result of a previous labor. Shaw, on the other hand, in his latest contribution—1917, says that among

100 specimens there were several from patients described as nulliparous, which showed changes typical of subinvolution. He states, in regard to these cases, that the patients from whom these specimens came, undoubtedly, had early miscarriages; and that the changes were, in reality, due to this cause. From my findings I feel certain that this must have been the case.

Goodall, in his paper on the involution of the puerperal uterus, 1910, briefly reviews the literature to date, and corroborates most of

FIG. 3.—Chronic metritis. Increase in size due chiefly to marked amount of fibrous tissue. Muscle wall measures 27 mm. Three-fourths actual size. *Surgical Path.*, No. 1206.

Pankow's work. As an introduction, Goodall describes in minute detail the histology of the nulliparous and multiparous uteri, dividing the uterus into three zones: the inner, or submucosal; the middle, or vascular; and the outer, or subperitoneal. In the nulliparous uterus the distribution of elastic tissue is as follows, in the inner third, the submucosal zone, the elastica interna of the arteries is, comparatively, very delicate and, at times, very imperfect. The media of the vessels present only a slight amount of fine elastic tissue, and frequently this cannot be definitely demonstrated. Goodall finds, contrary to other writers, fine elastic fibrils about the muscle

fibers of the inner zone. In several specimens which I studied, the elastic tissue between the muscular tissue of the inner zone was, apparently, lacking. Goodall has never failed to make this finding in uteri of individuals over fifteen years of age. He attributes this condition to the intensity of the Weigert stain; this may be due to overstaining, as fibrous tissue takes the stain. Staining with orcein, or some other method, might have brought out this point. In the vascular zone, in the larger vessels, the elastica interna

FIG. 4.—Hypertrophy. Nulliparous uterus. Increase due chiefly to increase in musculature. Myometrium, 22 mm. Only slight increase in fibrous tissue. Three-fourths actual size. *Gyn. Path.*, No. 577.

is prominent, and presents a homogeneous corrugated band. In slanting sections of the vessel it will be seen that the elastica interna consists of thin, closely parallel fibers running together. In the media elastic tissue fibers are distinctly seen; none of them encircling the vessel completely. In the adventitia, and between the muscle bundles of this zone, very little elastic tissue is observed. In the outer zone immediately under the peritoneum, there is a layer of fibrous and elastic tissue, which branches out freely between the muscle bundles and between the smaller fasciculi. It gradually disappears as it approaches the middle zone, but frequently it may

be traced to the vessels of this zone. Goodall states that in some nulliparous uteri the elastic tissue may be so increased as to represent a uniparous uterus. In none of the nine cases of this character which I examined, however, was I able to demonstrate this change.

In the inner third of the nulliparous uterus, the most characteristic sign of this type is the presence of a thick collar of elastic tissue which surrounds the weak walls of the small arteries, and which may either encircle the vessel completely, or it may be crescentric in character. This tissue has some interesting features, it is conspicuous by its isolation in a tissue which is comparatively free from stout elastic tissue; it sends very few fibers into the surrounding tissue from its outer margin; it lies in immediate contact with the media of the vessels, though in some cases a thin layer of fibrous tissue intervenes. Goodall suggests that these changes might occur in other conditions. As an example he mentions large submucous myoma, the changes taking place after the removal of the tumor. This certainly appears probable. Goodall asks the question, whether or not the changes are a necessary sequence of pregnancy? He states that two of his nulliparous specimens show no vessel changes whatsoever, and only a slight increase in the elastic tissue in general. In my series all parous uteri revealed the vessel changes in the inner zone.

In the middle zone the vessel walls are thicker and contain a large amount of elastic tissue in their media. The elastica interna is usually composed of many concentric layers. The numerous re-duplications of the elastica interna may almost completely obliterate the lumen. This hypertrophy of the internal elastic membrane so impinges on the media that it may almost cause its disappearance, a case in which the hyperplastic layers of the elastica interna and adventitia meet. The elastic tissue in the adventitia is, usually, strikingly increased; and continuations of these fibers run plainly into the interfascicular tissue. The veins are frequently constructed of irregular lumina; the walls are built up of abundant diffusely placed elastic tissue, sometimes taking in the whole vessel, at other times forming only a very small part of it. Every intermediate type, between these extremes, is found. In the outer zone there is considerable increase in the elastic tissue under the peritoneal surface, between the muscle fibers, and around the vessels; for the most part it appears in a swollen condition and in large strands. In the vessels themselves the elastica interna is usually normal in appearance, and the muscular wall is well defined; but one frequently sees an increase of the elastic tissue of the media.

The thickly walled veins consist of muscle, with fibrous and elastic tissue interdispersed; the elastic tissue constitutes the bulk of the vessel.

Goodall chiefly describes the involution of the circulatory system after labor. He studied a series of puerperal uteri, and some of his conclusions are as follows:

(1) The uterus renews all its arteries after each pregnancy. The renewal always consists in the building of a new vessel within the lumen of the old one. In cases in which a small vessel is built within one of smaller caliber, *i.e.*, vessels that supply the placenta, the new vessel will have three completely new coats, interna, media, and adventitia. In the case of a vessel which has to reduce its caliber but slightly, *i.e.*, ordinarily vessels that do not take part in the placental supply, the new vessel will build for itself a new interna and incorporate as much of the media of the old vessel as is required to complete its wall.

(2) In normal cases, the walls of the old vessels, which have become superfluous, slowly undergo destructive changes, and are completely absorbed.

(3) Under the influence of advanced age, chronic wasting, or acute disease, the destruction and absorption are very incomplete.

(4) The difference between the parous and nulliparous uteri arises out of the incompleteness of destruction and absorption of waste products.

(5) When elastic tissue of the parent vessel remains in the uterus unabsorbed, it undergoes either "vitreous degeneration" or "vitreous hypertrophy." The latter, unless disturbed by a subsequent pregnancy, will remain throughout the woman's life.

(6) The fibrous tissue undergoes hyaline degeneration, with slow absorption of the hyaline substance.

"Vitreous degeneration" is a term which Goodall suggested for the changes which take place in the elastica interna and elastic tissue in general during involution. The process starts with the initial swelling of the elastic tissue until its final absorption in the process of involution. Goodall describes the condition as follows: The elastica begins to swell to enormous proportions, and with this swelling the fibers, instead of staining deep black, take a deep red Port wine color. This change first affects the sides of the elastica interna, the intervening portion still holding the black stain. The entire elastica becomes a deep red, swollen, hyaline mass. The subsequent stages consist in a gradual loss of staining properties. From the dark red color it fades to a pale red, homogeneous, vitreous

substance; then to a pale brick red, into a yellow, and finally to a colorless mass. These descriptions pertain to sections stained by the Weigert's Von Gieson stains. If at some stage of this degeneration the process is arrested, the stage of absorption not being reached, the swollen elastic tissue has the power of regaining its staining properties with Weigert's. It does not take the stain so deeply, but it is, usually, seen as a bluish black or grayish black substance surrounding the new vessels more or less completely, all depending

FIG. 5.—Photomicrograph. Chronic subinvolution. Vessels of the inner zone show marked increase in the elastic tissue. Note how the new smaller vessel is completely surrounded; the thin internal elastic membrane can be definitely seen. Weigert's Van Gieson stain. *Gyn. Path.*, No. 686.

upon the lack or amount of absorption that has taken place. Goodall calls this process "vitreous hypertrophy." This vitreous hypertrophy, owing to lack of absorption of the old vessel, is found, more or less, in all multiparous uteri. Very rarely this absorption may be so complete as not to show at least a few vessels in the condition described. I found no uniparous or multiparous uterus without it, and no nulliparous uterus with it. When this absorption of the elastic tissue is arrested throughout the uterus in a marked degree, it gives rise to the condition known as chronic subinvolution. The normal multiparous uterus shows these changes in a varying degree; in many, particularly in the uniparous uteri, only the slightest traces are left, and the amount in many instances seems directly proportional to the number of pregnancies. This, however, is by no means

the rule, as in my series there were several multiparous uteri which showed little change; and a few, with one or two pregnancies, in which the changes were quite marked.

Following the work of Goodall, the investigations of Shaw on so-called chronic metritis are of great importance. The three publications of Shaw appeared in 1907, 1914, and 1917; and it is particularly interesting to note the distinct progress made successively in each of these. In the last article, which appeared in Eden and Lockyer, "New System of Gynecology," he reviews the subject

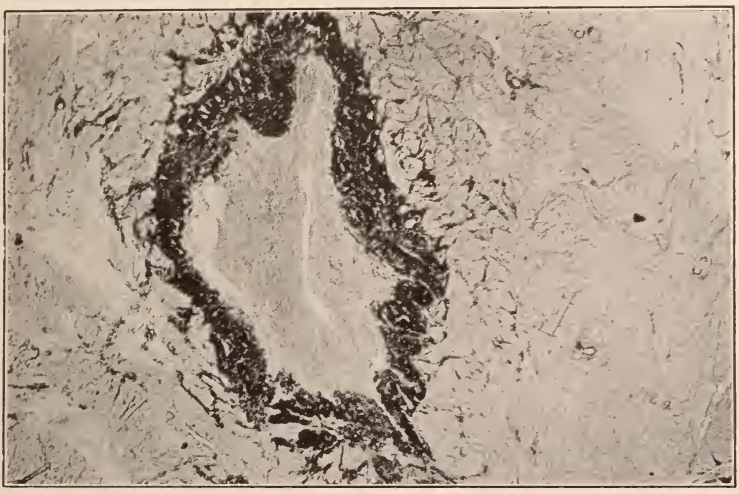

FIG. 6.—Photomicrograph. Chronic subinvolution. Middle third of vein markedly thickened, owing to the large amount of elastic tissue in outer half of wall. The surrounding intermuscular elastic tissue is increased and can be traced to the vein wall. Weigert's Van Gieson stain.

thoroughly and classifies the uteri according to their pathology. This classification I have strictly adhered to in describing and diagnosticating my series.

Shaw, 1906, discussed the pathology of chronic metritis. At this time his investigations were limited to the hemotoxylin and eosin and Von Gieson staining. He studied particularly the relative amounts of muscular tissue and fibrous tissue. His method consisted of examining the entire section from peritoneum to mucosa, taking in as many as forty or fifty fields. This was done by placing the slide on a mechanical stage and moving it from field to field under high power until the entire thickness of the wall was covered. In regard to the normal amount of connective tissue he quotes Meier,

who studied a series of uteri in this manner. Under normal conditions Meier found a regular increase in musculature from childhood to twenty years. For the next ten years a constant relation exists between muscle and fibrous tissue. After the age of thirty the musculature progressively decreases in quantity. This writer quotes Lorentz in estimating the amount of connective tissue in chronic metritis as from 45 to 60 per cent., with an average of 50 per cent. Meier places the connective tissue for a normal parous uterus at 46.5 per cent. Shaw estimates the latter at 39.4 per cent.,

Fig. 7.—Photomicrograph. Chronic subinvolution. Outer third of uterus, showing marked increase in elastic tissue between the muscle bundles. The internal black areas in the picture stained a deep blue-black with Weigert's. Weigert's Van Gieson stain. *Gyn. Path.*, No. 402.

and the former at 30.5 to 50 per cent., with an average of 40.4 per cent. Shaw calls attention to this very slight increase in fibrous tissue, 4 per cent. in the cases of Meier and Lorentz, and only 0.8 per cent. in his own calculations. He deduces from this estimate that the marked increase in thickness must be due to other structures, and thinks that it is the result, in great part, of hypertrophy of the muscle.

The conclusions reached in this paper are as follows:

1. Chronic metritis is a simple hypertrophy of the mesometrium and is not a connective-tissue hyperplasia.

2. The percentage of connective tissue varies considerably in the different specimens of chronic metritis. There is no evidence

of active inflammation as shown by small-celled infiltration or cicatricial tissue.

3. Chronic metritis is never a primary affection; it is, usually, secondary to chronic endometritis, though it may be associated with any pelvic or uterine disease leading to increased uterine contraction or vascularity. The average age of the patients was 38.3, which is well below the average age of the menopause, and proves that the climacteric period is not the causal factor.

These conditions bring out some interesting points. In the first place, as Shaw's later work undoubtedly proves, many of the

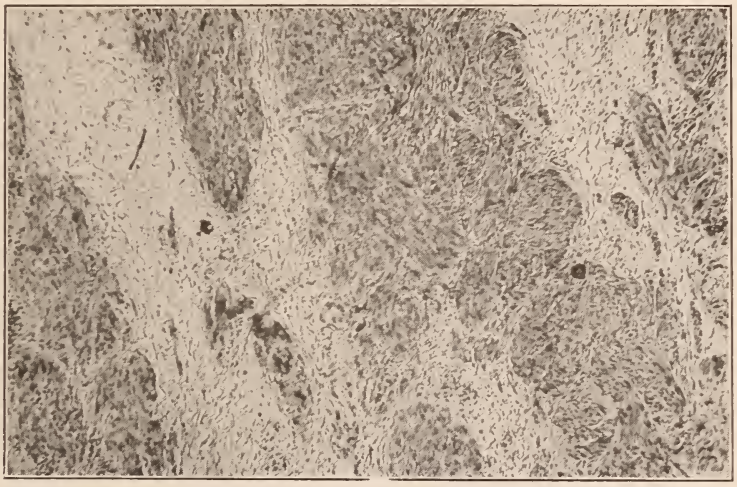

FIG. 8.—Photomicrograph. Chronic subinvolution. Edema and liquefaction of the connective tissue of the outer third. Hyaline areas were occasionally seen in such sections, both in the connective tissue and in a few of the muscle bundles immediately adjacent to the white edematous or liquefied areas seen in the section. Hematoxylin and eosin stain. *Gyn. Path.*, No. 695.

cases studied were cases of chronic subinvolution, particularly those showing the increase in muscle and the absence of small cell infiltration. Secondly, in the cases of marked increase in connective tissue, this increase is not enough to account for the entire size of the organ, and the muscularis tissue also plays a rôle in it, the increase in such cases, a point which will be discussed under "True Chronic Metritis."

Shaw, 1914, considers the classification of chronic metritis, stating that there are at least two, if not more, divisions. In this paper he describes two of these groups. Shaw points out the fact that subinvoluted uteri with large amounts of elastic tissue form the main

mass of these uteri, which, clinically, are diagnosticated as chronic metritis. The first group he describes under the head of "Chronic Subinvolution." This group consisted of enlarged uteri associated with symptoms of pain, hemorrhage, and leukorrhea—hemorrhage was the most constant of these symptoms. He presents twenty-five cases in this group. The most important changes in these uteri are to be found in the amount and distribution of elastic tissue, which, in this class, has the same distribution as in the normal multiparous uterus, except that it is more abundant. The vessels are surrounded by thick slabs of dense elastic tissue, and much of it is found between the muscle bundles. Hemorrhage was particularly marked in those cases which showed extensive lesions. Of the twenty-five cases, all but two suffered from hemorrhage. Twenty of them had three or more children. Nine of these cases had findings of pelvic inflammation.

In the second group Shaw places the cases due to hypertrophy. In the former group uniparous or multiparous uteri alone are concerned; but in the hypertrophy group only nulliparous cases are found. These uteri are regularly enlarged and cause symptoms similar to those of the previous group; namely, hemorrhage, pain, and leukorrhea. In four cases which were placed in this group, a marked thickening of the endometrium and musculature was observed. The findings here were a normal nulliparous distribution of elastic tissue, with no increase in the percentage of fibrous tissue. The thickness in this group is as great as in the preceding group, but instead of being due to lack of absorption, it is due to an evident hypertrophy of all the constituents of the uterine wall.

Shaw thinks that in these cases the endometrium is primarily at fault. This thickening of the endometrium, if persistent, will act as a foreign body and give rise to increased contraction, resulting in so-called "work hypertrophy." The mucosa, still more increased at the menstrual period, which should give rise to still further contractions, causes, as was the finding in all four of his cases, a severe dysmenorrhea. In my series I also put in this class several uteri of women who had had children. Histologically they answered all the requirements of this group: a marked hyperplasia of the endometrium; no increase in connective tissue; a uterine wall showing marked thickness, due almost wholly to muscular tissue; no increase in elastic tissue except for a slight amount in one or two submucosal vessels, which stamps the uterus as parous. I considered this division the only one in which these specimens could be placed, and as Shaw considers these changes in the wall secondary

to a marked glandular hyperplasia of the endometrium, as a result of "work hypertrophy," a supposition which is wholly logical, I do not see why these uteri should not be put in the second group. Glandular hyperplasia occurs in the multiparous as well as in the nulliparous uterus; and if we find a multiparous uterus, as I have done, with no increase in fibrous tissue, no increase in elastic tissue, and no signs of inflammatory reaction, yet with a marked hyperplasia and a markedly thickened uterine wall, we must, necessarily place it in this group.

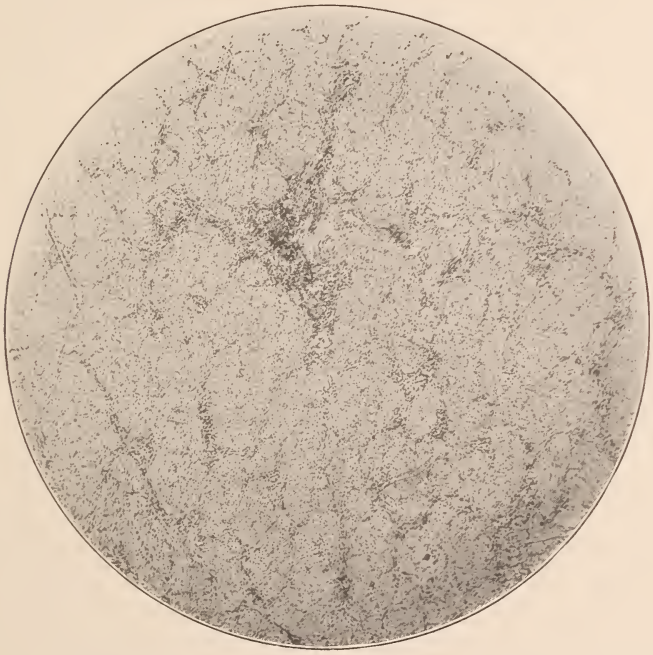

FIG. 9.—Photomicrograph. Chronic metritis. Outer third of the uterus showing a rather marked diffuse lymphoid cell infiltration. A large area is seen a short distance from the center of the field. Hematoxylin and eosin stain. *Gyn. Path.*, No. 130.

Shaw, 1917, described chronic metritis, subinvolution, and hypertrophy. The additional classification of chronic metritis is the principal feature of this publication. He states that only the uteri which show a definite pathological change due to inflammation, the late result of either an acute metritis or a chronic inflammation, belong to this class. He points out that this term was used on the supposition that the enlarged uteri, complicated with pain, hemorrhage, and leukorrhea, were solely of inflammatory origin; but that

they were really the result of subinvolution. Clinically, he suggests, the term is convenient for general application, but pathologically it must be divided into classes.

In my opinion, although I found evidence of inflammation in thirteen out of seventy-five specimens, it is a question whether this term is the best and most descriptive. This point will be discussed later. Shaw asks the question: "Is there such a condition as true metritis?" He then states that in the whole literature of the subject there is much confusion between chronic metritis and subinvolution; and, while the microscopic appearance of the latter condition is well described, he has been unable to find a separate detailed description of the former and of the latter. These statements, as I have mentioned before, led me to take up the study, and I have been able to show cases that clearly fulfil all requirements necessary to place them in this class; in particular, case (*Gyn. Path.*, No. 130), which will be explained fully when in the account of my own experience with this group. Shaw says, to prove that true chronic metritis does occur, that it is necessary to make use of a uterus which has never been pregnant; otherwise changes due to subinvolution obscure the results. With this statement I cannot agree. Frequently the changes due to a previous pregnancy are so slight that they are found only after careful search in the entire section; and it is reasonable to assume that chronic inflammation of the uterus may occur in a uterus of this kind as well as in any other. He further states that multiparous uteri are removed with the diagnosis of chronic metritis, in which the symptoms date from a septic infection, and which show matted appendages, the unmistakable signs of an old inflammation; but, microscopically, these cases reveal only the changes of chronic subinvolution. This is substantiated by several similar specimens of my series. It does not necessarily mean, however, that we may not have a multiparous uterus without signs of subinvolution and inflammatory lesions. In Shaw's series, only one case could be placed in this class. In this instance the patient was thirty years old. A nulliparous uterus and its appendages were removed. The appendages were matted together and many adhesions appeared throughout the pelvis. The uterine wall was hard and measured three-fourths of an inch in thickness. The only change in the uterine wall, found microscopically, was an increase in fibrous tissue throughout its entire structure, particularly in the outer third. The presence and distribution of elastic tissue were normal. No mention is made of lymphoid cell infiltration.

In the series of seventy-eight specimens which I studied, I followed, more or less, the routine of Shaw, using his classifications, and attempting to place the specimens accordingly with a few exceptions. In several cases, where there was an obvious overlapping between chronic metritis and chronic subinvolution, I placed the specimens in a separate class. Whenever a uterus showed no definite changes, no marked thickening, no increase in fibrous tissue, no increase in elastic tissue, no round-cell infiltration, or hypertrophy, it was placed in the class of normal uteri. There were

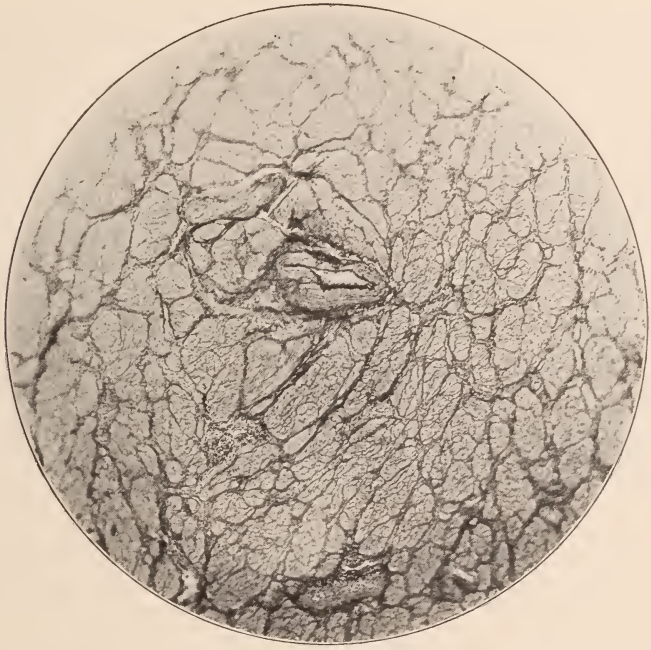

FIG. 10.—Photomicrograph. Chronic metritis. Outer third, showing marked increase in connective tissue. The intermuscular strands stain bright red with Weigert's Van Gieson stain. *Gyn. Path.*, No. 130.

also several specimens that could answer only the description of the senile uterus. Blocks were taken from the thickest portion of the uterine body including endometrium and peritoneum. These were placed in celloidin and cut 10 to 12 microns in thickness, the smaller blocks in ten, the larger blocks in twelve. Of each block two sections were stained, one by hematoxylin and eosin, and another by the Weigert-Van Gieson method. In using the latter, I allowed all sections to lie in the stain over night. The clinical data secured were similar to those obtained by Shaw in his

work of 1914; namely, the age of the patient, number of pregnancies, number of years since last pregnancy, duration and character of symptoms, especially concerning as regards hemorrhage, pain, and leukorrhea. The operative and subsequent microscopic findings in regard to pelvic inflammation were also recorded. The sections were measured, and the thickness of both endometrium and myometrium was determined separately. The condition of the endometrium, and the distribution of elastic tissue throughout the wall, and around the vessels, were noted and described; the presence of

FIG. 11.—Photomicrograph. Chronic metritis. Outer third, showing marked increase in connective tissue. The dark intermuscular strands took a bright, crimson stain with the Weigert's Van Gieson stain. No elastic tissue stain was at all evident, with the exception of a few fine strands.

round-cell infiltration was looked for. The hematoxylin and eosin stained sections were preferably employed for this purpose. The amount of increase or decrease of connective tissue was carefully studied in relation to the uterine muscularis.

This routine study placed the following number of cases in the various classes: chronic subinvolution, thirty-eight; chronic metritis, thirteen; chronic metritis and chronic subinvolution combined, nine; hypertrophy, four; normal, eleven; senile, three. Each group will be described separately; the pathological groups will be taken first, in the order of their frequency. After the description of each group the clinical history and pathological description of one or two of the best examples of that particular type will be given

in detail. The illustrations for the most part are taken from these cases and will be referred to in the text.

Chronic Subinvolution.—In this group were placed those specimens which show a definite increase in the distribution of elastic tissue, which, in many cases was unusually great. The increase was particularly marked around the arteries of the inner third, around both veins and arteries of the middle zone, and between the muscle bundles of both middle and outer thirds, particularly the outer. Fig. 5 shows the marked increase around the arteries of the inner third. It illustrates the so-called collar or pad of elastis tissue very well. In these cases there was little or no absorption as the prominence of these collars indicate. Fig. 6 shows very well the marked increase in elastic tissue in the wall of a vein of the middle third; the entire outer half of the wall is made up of elastic tissue, sending many ramifications into the adjacent muscle bundles. This picture was often seen throughout this class. An almost constant feature was the marked increase between the muscle bundles of the outer third, as illustrated in Fig. 7. The increase is shown by the heavy black strands interlacing between the muscle bundles; practically no red connective tissue is seen in such a section. The black in the picture stained intensely black with Weigert's in the section.

Another constant feature of this class was the considerable amount of edema present in many of the specimens. This edema was occasionally noticeable in the cases of chronic metritis, but was more constantly found in the cases of chronic subinvolution. This picture was particularly marked in many cases. It was found most frequently in the inner portion of the outer third where the lymphatics are comparatively large and numerous. The connective tissue between the muscle fibers was distinctly edematous and often seemed to be in a state of liquefaction. Hyaline changes were occasionally found in these areas and sometimes the adjacent muscle fibers seemed to be involved, as shown in Fig. 8. The lymphatics were dilated in many instances.

The whole picture impressed me by its resemblance to the so-called hyaline changes and liquefaction in myomata. In my opinion, this condition plays a considerable part in increasing the size of the uterine wall. The individual muscle cells also seemed enlarged; in many instances they stain poorly and have a cloudy appearance. I take it that in these cases the apparent increase in the musculature is due to the enlargements of the individual cell. By a rather crude method with a stage micrometer, I counted several similar areas in

a nulliparous, normal uterus and compared them with similar areas in cases of subinvolution and chronic metritis. In the two conditions last-named there were found, on an average, about three-fifths as many cells as in the normal nulliparous uterus. The fewest cells were found in the cases of marked chronic subinvolution, a fact which indicates that there is considerable increase in the size of the individual cells. I conclude, therefore, that the thickness of the walls in cases of chronic subinvolution is due to several factors. In the order of their importance they are: marked increase in elastic tissue,

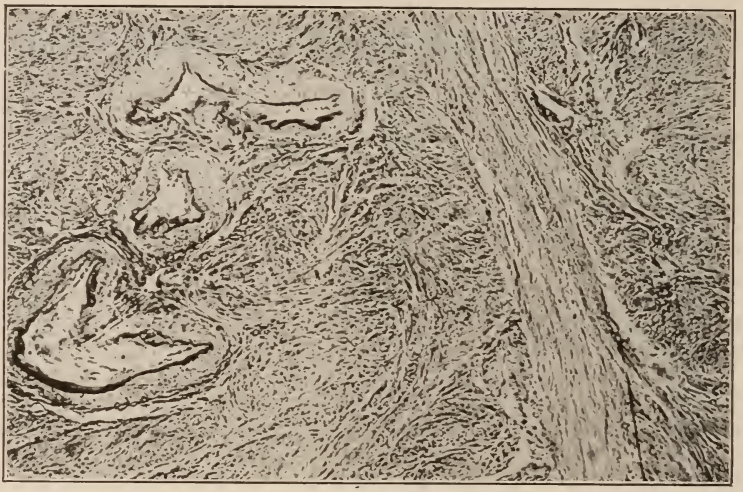

FIG. 12.—Photomicrograph. Hypertrophy. Inner portion of middle zone. Normal nulliparous distribution of elastic tissue in and around the vessels. No increase in connective tissue. The section is made up almost wholly of muscle tissue. Weigert's Van Gieson stain. *Gyn. Path.*, No. 538.

edema and liquefaction of connective tissue, and hypertrophy, or, at least, enlargement of the individual muscle cells.

Thirty-eight cases were placed in this group. The age of the patients varied between twenty-six and fifty-three years. There were three between fifty and fifty-five; seven between forty-five and fifty; seven between forty and forty-five; fourteen between thirty-five and forty; three between thirty and thirty-five; and four below thirty. These figures show that about 60 per cent. of the cases were in the decade between thirty-five and forty-five, thus proving that the condition occurs most frequently during the ten years previous to the average time of the appearance of the menopause. The number of pregnancies ranged between one and fourteen. One case with fourteen; one, with nine; three, with eight;

one, with seven; three, with six; eight, with five; three, with four five, with three; seven, with two, and six, with one pregnancy. This condition shows that twenty-five out of thirty-eight cases had three or more children; the most marked changes taking place, as a rule, in the older cases, and those which have had repeated pregnancies. In my series there were several exceptions. The thickness of the musculature varied between 14 and 30 mm. There were five between 25 mm. and 30 mm.; seventeen between 20 mm. and

FIG. 13.—Photomicrograph. Senile uterus. Obliterative endarteritis. Hematoxylin and eosin stain. *Gyn. Path.*, No. 185.

25 mm.; fourteen between 15 mm. and 20 mm., and two at 14 mm. Of those between 15 mm. and 20 mm.; five were below 18 mm.; in other words, twenty-two were markedly thickened, nine were moderately thickened, and seven were only slightly thickened.

The endometrium was normal in sixteen cases, showing glandular hyperplasia in thirteen, chronic interstitial endometritis in seven, and senile atrophy in two. In the cases of glandular hyperplasia there was enormous thickening in many instances, several being of the polypoid type. The thickest endometrium in this series measured 9 mm. (Fig. 2). In none of these cases was any increase

in the connective tissue noticeable. No round-cell infiltration was found in the musculature. In only six cases evidence of inflammation of the appendages, or pelvic cellulitis appeared. The symptoms were chiefly pain and hemorrhage. Twenty-seven of the cases complained of pain; hemorrhage, in the form of intermenstrual or prolonged menstrual bleeding, was present in twenty-four, leukorrhea was present in thirteen. The duration of the symptoms

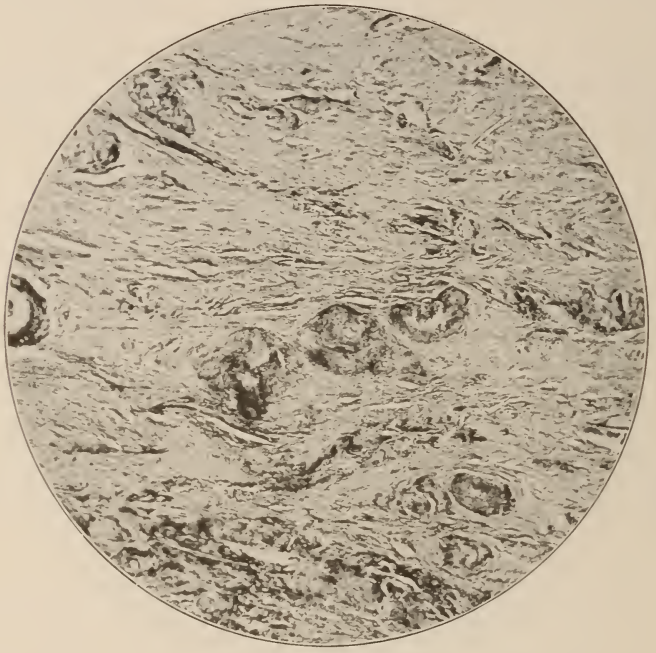

FIG. 14.—Photomicrograph. Senile uterus. Same field as Fig. 13. Weigert's Van Gieson stain. The black material in the picture stained blue-black with Wiegert's. This illustration shows the marked increase in elastic tissue in this field.

varied from six months to ten years, most frequently between two and three years; and very often a history was obtained in which the symptoms dated back to a previous pregnancy. As examples of this class, *Gyn. Path.*, No. 480, and *Gyn. Path.*, No. 468, will be taken.

Gyn. Path., No. 480.—The patient was forty-seven years of age; had had eight children, the last two years ago. Since her last pregnancy a partial prolapse of the uterus developed, with more or less constant pelvic discomfort, and a marked increase in the menstrual flow. She menstruated every two weeks during the past two years, the flow lasting three to four days at a time. Vaginal hysterectomy

was performed. The uterus was considerably enlarged and measured 12×6×5 cm. There was no evidence of pelvic inflammation. The uterine wall in its thickest portion measured 21 mm.; the endometrium, 1 mm., and was normal. Histologically no increase in connective tissue was found; there was no evidence of round cell infiltration, nor was there any of edema present in this case. The blood-vessels of the inner third showed, in most instances, a very marked collection of elastic tissue around the outer portion of the media. The vessels of the middle third, particularly the veins, showed an immense amount of elastic tissue (Fig. 6). The elastic tissue between the muscle bundles in the outer third was markedly

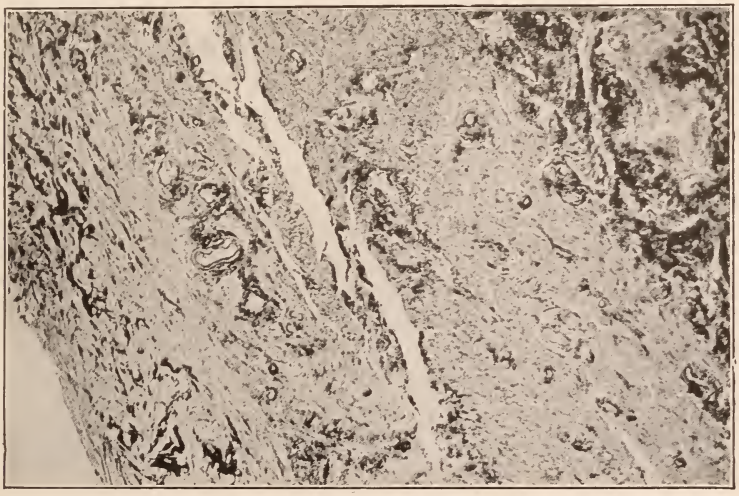

FIG. 15.—Photomicrograph. Senile uterus. Outer third, showing marked increase in elastic tissue. The black in this section stains blue-black with Weigert's. Weigert's Van Gieson stain. *Gyn. Path.*, No. 458.

increased. In this case the thickness could be readily attributed to the increase in the elastic tissue elements.

Gyn. Path., No. 468.—The patient was forty-one years of age. She had three children, the youngest being five years old at the time of the operation. Patient had profuse intermenstrual bleeding between the last two periods. On examination the uterus was found to be about twice its normal size and freely movable. No pelvic inflammation. Vaginal hysterectomy was performed. The uterine wall, including the endometrium, measured 39 mm., at its widest portion (Fig. 2). There was not the slightest evidence of small myomata in this uterus. Histologically the endometrium showed a marked glandular hyperplasia, and a slight increase in the amount of stroma. There was no increase in fibrous tissue. The elastic tissue was found decidedly increased about the vessels of the inner third, moderately increased about and within the vessels of the

middle third. There was a definite increase in the elastic tissue between the muscle bundles of the outer third. The muscle tissue was very distinct; the cells seemed rather large, but were comparatively clear, and they stained well. This case showed, undoubtedly, a slight hypertrophy of the muscle tissue. The edema was very slight. I attribute the thickness in this case alike to the elastic and muscular tissue.

In all the cases of this series where marked glandular hyperplasia was present, the hypertrophy of the muscle tissue was definite. The explanation is the same as that given in the true hypertrophy group. Namely, that it is secondary to a primary glandular hyperplasia.

Chronic Metritis.—Under the heading of chronic metritis were placed those uteri which plainly showed round-cell infiltration in the musculature, increased fibrous tissue, or both, without any of the features within the uterine structure characteristic of chronic subinvolution. In this class were placed thirteen specimens; of these, an increase in fibrous tissue and round-cell infiltration were present in nine specimens; four others showed increase in fibrous tissue without any evidence of round-cell infiltration. In these specimens the chief feature was the increase in fibrous tissue; in some specimens this was rather marked throughout the entire wall and around the blood-vessels of all zones. In several specimens where the increase was not general, it was pronounced in the outer half, especially in the outer third and around the blood-vessels of this zone. The small cell infiltration which was found in nine specimens, was, in three, very marked throughout the entire musculature; in the remaining specimens it was found diffusely distributed throughout the wall; and in a few of these cases considerable search was necessary before this lymphoid cell infiltration could be detected.

The uterine wall in these cases was, for the most part, considerably enlarged. A normal multiparous uterine wall should vary between 12 mm. and 15 mm. In the walls of several uteri as thick as 17 mm., nothing unusual could be detected. In this series the largest measured 27 mm.; five were between 20 mm. and 25 mm.; five were between 18 mm. and 20 mm., and below. In other words, six specimens showed marked thickening, five of which were decidedly thickened, and one of which was practically of normal thickness for the multiparous. This, however, was a nulliparous uterus, and, therefore, it was only slightly thickened.

There were in this series three nulliparous and ten parous uteri, eight of which were uniparous, and two multiparous. In none of these were the changes which occur in the vessels of parous uteri easily demonstrable. These changes were found in all the parous

uteri of this series, but were not at all marked; in many there was only the very slightest evidence of these changes. In one instance of induced abortion, pregnancy of three months' duration, six years previous to operation, definite evidence of these changes in two or three vessels was revealed. In another specimen, from a uterus which delivered a six months' fetus six years before operation, the evidence was very slight, as far as the vessels were concerned. However, the changes were sufficiently ample to enable one to diagnosticate a previous pregnancy.

The endometrium was interesting. In the specimens showing chronic interstitial endometritis the lesions in the wall were especially marked. There were five such cases, four of which were associated with inflammatory disease of the appendages. In five cases the endometrium was normal; in two, there was glandular hyperplasia; and in one a senile endometrium was found. Evidence of chronic inflammation of the appendages was present in nine of the cases. A typical example of this type of uterus may be seen in *Gyn. Path.* No. 130.

Gyn. Path., No. 130.—Patient thirty-three years old. One pregnancy six years ago. Pregnancy occurred immediately after marriage, and terminated in a miscarriage at the end of the twenty-fourth week of gestation. No complications. Menstrual history: slight increase in duration and quantity. Past history negative, except an operation for gall-stone two years previous to admission to the hospital. Symptoms: pelvic pain for many years. Several acute attacks of pelvic peritonitis. Present attack started with a chill and a sudden acute pain in left lower quadrant two weeks before admission. Operation: supravaginal hysterectomy; bilateral salpingo-oöphorectomy. Uterus enlarged to twice its normal size; walls very much thickened, measuring in its thickest portion 28 mm. Fibrous tissue greatly increased; consistency, very firm; no nodules. Both tubes four times their normal size, and measured at ampulla 1½ inches. Tube wall firm, lumen contained a small amount of pus. Microscopic section of tube showed a marked infiltration of polynuclear, plasma, and lymphoid cells throughout the wall and the lumen. Marked increase in connective tissue throughout the wall of the tubes. Tubes and ovaries markedly adherent.

Microscopic description of section of uterus. Hematoxylin and eosin stain. Endometrium shows glands normal in number, size and shape. Considerable small cell infiltration throughout the stroma. Endometrium 1½ mm., the muscularis 27 mm. in thickness. The latter is diffusely infiltrated with small round cells (Fig. 9). Vessels of the mid-zone are prominent and thickened; vessels in the inner zone are not prominent. The nuclei, in the

media of the vessel wall, stain well. There are slight hyaline areas surrounding some of the blood-vessels.

Weigert's Van Gieson stain shows a marked general increase in connective tissue, particularly in the subperitoneal area. The connective tissue is also distinctly increased about the blood-vessels of the outer and middle zones (Fig. 10). The vessels of the inner third show only a slight amount of connective tissue about them. In no place throughout the section does Weigert's stain indicate an abnormal distribution of elastic tissue. The internal elastic membrane, and the fibrils in the media, are well stained; they are, apparently more prominent in the large vessels of the mid-zone. The inter-fascicular elastic tissue in the outer third is well stained, but not increased. One vessel, an artery, shows a small amount of degenerative elastic tissue in the periphery, which might be considered evidence sufficient to stamp the uterus as parous.

Surg. Path., No. 1206.—Patient twenty-nine years old. Had one child seven years previous to operation. Patient complained of increased and painful menstruation for the past four years. Operation: supravaginal hysterectomy, with a double salpingo-oöphorectomy. The uterus was of normal contour, but decidedly enlarged. The whole pelvis was the seat of chronic inflammatory process. Both tubes were thickened, measuring about three-fourths of an inch in diameter, they were universally adherent, and matted to the ovaries; the lumen of each tube contained some of pus. Microscopically, a picture of chronic salpingitis was revealed. The uterus was very firm; a cross-section in the anteroposterior diameter is shown in Fig. 3 and is three-fourths of the actual size. The wall measured 21 mm. including the endometrium, which measured 2 mm. The enlargement of the wall was due entirely to the increase in connective tissue. There was no evidence of subinvolution by nonabsorption of elastic tissue; only the slightest increase was observable, just enough to stamp the specimen as parous. The endometrium was thickened and showed decided chronic interstitial endometritis. The hematoxylin and eosin-stained section showed a diffuse lymphoid cell infiltration throughout the musculature. The connective tissue was greatly increased throughout all zones, particularly in the outer third and around the blood-vessels. Illustration No. 11 shows the increase in the outer third very plainly.

Chronic Subinvolution and Chronic Metritis Combined.—In this class are the cases in which the changes were such that the specimen could not be placed conclusively in either of the two classes just described. In this class were placed nine specimens, all showing signs of chronic subinvolution. In five cases the connective tissue was very much increased; in three, the increase was moderate; and in one, there was no increase in the connective tissue; in six there

was round cell infiltration, which in three of the cases was excessive. In the section which showed no increase in connective tissue, round cell infiltration was marked. The age of these patients ranged from twenty-seven to fifty-three years; of these, two were above fifty, four between forty and fifty, and three between twenty-seven and forty. The number of pregnancies varied from one to seven as follows: one, with seven; two, with six; one, with five; one, with four; one, with three; two, with two; and one, with one. In four cases a pelvic inflammatory condition, involving the appendages, was present; three, showed chronic interstitial endometritis; three, had a normal endometrium; two, revealed a mild glandular hyperplasia, and one, a senile endometrium. Seven suffered pain, five had increased menstrual bleeding, and four had leukorrhea. The thickness of the myometrium varied between 17 mm., and 28 mm.; in these three the thickening was between 25 mm. and 30 mm.; in four, between 20 mm. and 25 mm.; and two, under 20 mm. The increase in thickness in this class, as can be seen from the figures, was considerable.

As an example of this class, *Gyn. Path.*, No. 928, will be taken. The patient was fifty-three years of age, and had been pregnant six times. The last occurred twenty-four years before, and she passed the menopause six years ago. During the last three years this patient has suffered from occasional uterine hemorrhages. Operation: vaginal hysterectomy. No evidence of inflammation of the appendages appeared. The endometrium measured 3 mm., and showed a slight chronic inflammation; the myometrium measured 26 mm. Histologically, the myometrium showed a marked increase in fibrous tissue; this was particularly noticeable in the outer third and around some of the vessels of the middle zone. There was a moderate increase of the elastic tissue around the blood-vessels of the inner and middle thirds; a moderate increase between the muscle bundles was also observable. With the hematoxylin and eosin stain a definite lymphoid infiltration was occasionally found in the musculature.

Hypertrophy.—In this class were placed those uteri in which there was no evidence of chronic metritis or chronic subinvolution, but which showed a definite glandular hyperplasia, and a marked increase in the thickness of the myometrium, due essentially to muscle tissue. In this class was one specimen of a nulliparous woman, which was not as classical an example as the case of Dr. Donald, described so well by Shaw in 1917, but which was characteristic enough to be placed in this category (Fig. 4). Three multiparous uteri were also classified in this group. These showed

no increase in the elastic or fibrous tissue, no evidence of chronic inflammation, and no marked edema. In all four cases the endometrium revealed a marked glandular hyperplasia. In the nulliparous uterus the endometrium measured 3 mm., and an unmistakable glandular hyperplasia was present. In the three multiparous uteri, the glandular hyperplasia was very marked. The endometrium in these cases measured 5 mm., 7 mm., and 7 mm. respectively. There was no evidence of inflammation in the endometrium, nor was there a trace of inflammation of the tubes. The muscle cells stained well, and seemed to increase in size rather than in number. Here, also, in a comparison between similar areas in these uteri and in a normal nulliparous uterus, the average showed that the fields in the hypertrophic uteri contained, approximately, only three-fifths as many cells as the similar fields in the nulliparous uterus. These were rather crude determinations, but accurate enough to illustrate the point.

As examples of this type of uterus, *Gyn. Path.*, No. 645 and 577 will be described. The patient, No. 645, was thirty-nine years old and had six children, the last child having been born ten years ago. Her chief complaint was prolapse of the uterus, dragging pain, and slightly increased menstruation. These symptoms dated back about six years. The specimen was obtained by the interposition operation, and is part of a large triangular section from the fundus uteri, including the entire anteroposterior thickness of the body. The endometrium measured 5 mm., and the myometrium 29 mm. The thickness of the muscle wall was due chiefly to an increase in muscle tissue, in addition to a very slight amount of edema in the outer third. There was no increase in the elastic tissue in any zone, with the exception of a few small pads around one or two vessels of the inner third. The connective tissue present was very moderate.

The nulliparous specimen, *Gyn. Path.*, No. 577, is the uterus of an unmarried woman forty years of age, who had complained of excessive dysmenorrhea, notwithstanding palliative treatment. Operation: abdominal panhysterectomy. The uterus was considerably enlarged; thickness of the myometrium, 22 mm., and that of the endometrium, 3 mm. The gross specimen is shown in Fig. 4. This illustration is, approximately, three-fourths actual size. Histologically, the muscle tissue was most pronounced. The fibrous tissue was very slightly increased, and the elastic tissue was in entire harmony with the classical distribution of the nulliparous uterus. A few vessels in the lower portion of the endometrium showed an increase in elastic tissue, the result of menstruation. The muscle tissue, stained, showed no edema, nor was there edema of the outer zone. Inflammatory signs were absent in the endometrium and myometrium.

Normal Uteri.—In this class there were eleven uteri, the walls of which were approximately of normal thickness and showed none of the changes described in the previous groups. The six multiparous uteri of this class indicated no marked increase in elastic tissue. In the nulliparous uteri the distribution was normal. The thickness of these uteri varied between 8 mm. and 16 mm. Pain was present in four cases; in eight, an inflammation of the tubes might have accounted for this symptom. One of these specimens was interesting because of the pelvic findings at the autopsy. In an attempt to abort herself, thinking she was one month pregnant, the anemic girl punctured the cul-de-sac and produced an acute pelvic peritonitis. She died, subsequently, of tuberculous pneumonia. At the autopsy, which was performed about three months after, she had missed her "period," a normal nulliparous uterus, with intact internal os, and a practically normal endometrium, was found. However, a marked pelvic inflammation was present in the form of a subacute pelvic peritonitis. It was thought, at autopsy, that the patient had never been pregnant. Menstruation ceased because of failing health; but she had reason to believe herself pregnant, and, in attempting to abort the supposed pregnancy, she punctured the cul-de-sac, penetrating the peritoneum. Sections of this specimen portray a marked fibrino-purulent peritonitis, but absolutely no evidence of inflammation below the peritoneum in the outer portion of the uterine wall. No lymphoid infiltration appeared in the uterine wall, and no changes in the blood-vessels; in other words, the uterus proved to be surrounded on all sides by pelvic inflammation without becoming involved in the inflammatory process. There were several instances under the head of chronic subinvolution complicated with marked pelvic inflammation without an infection of the uterus.

The Senile Uterus.—Three cases were placed in this group. Two were multiparous uteri and were striking examples of this condition; the other uterus was that of a nulliparous patient, aged forty-two, who was approaching the menopause. In the latter case the myometrium measured 9 mm., and the endometrium 0.75 mm. The endometrium was atrophic; the glands were greatly reduced in number and size, and the stroma distinctly diminished. The uterine wall showed a diminished amount of muscle tissue and an increase in fibrous tissue which, for the most part, particularly in the outer third, gave evidence of hyaline change. This was noticeable also about the larger vessels. The lumina of nearly all the vessels

were narrowed and, in some instances, obliterated. With the Weigert Van Gieson stain, no increase in elastic tissue could be ascertained. This condition was a marked contrast to the finding of elastic tissue in the multiparous uteri of advanced years.

One senile multiparous uterus, *Gyn. Path.*, No. 185, was exceedingly small. The patient, aged sixty-two had had four children. Menopause occurred twelve years previous to the vaginal hysterectomy. The clinical diagnosis was cystocele and prolapse of the uterus. The uterine wall, at its widest point, measured 7.5 mm., the myometrium 7 mm., and the endometrium 0.5 mm. The endometrium was markedly atrophic with only a few glands, here and there and the lining mucosa intact. The myometrium was made up, principally, of muscle and elastic tissue, the muscle constituting about three-fifths of the thickness. There was scarcely a trace of connective tissue in this section. In the hematoxylin and eosin sections, the blood-vessels were enormously thickened and were apparently made up of hyaline tissue. In many of the sections the lumina of the vessels were obliterated, and in all of them they were considerably narrowed. With the hematoxylin and eosin stain a hyalin change is found in the outer zone. With the Weigert Van Gieson stain these areas, as well as the apparent hyaline change about the vessels, became a diffuse granular bluish-black. It was quite apparent in the outer portion and in the vessels of this zone. The vessel wall stained bluish-black in many cases, and in other places it involved the greater portion only. All areas show these vessel changes clearly.

Goodall describes obliterative endarteritis as occurring in the inner third of the uterus after labor, and compares the process to that of the formation of corpora albicantia in the ovary. The process is, briefly, a proliferation of elements of the intima, the closing of the lumen, and gradual hyaline changes of all the constituents of the vessel. That the elastic tissue of the vessel wall is the last tissue which undergoes this change is well seen in the specimen of the two multiparous uteri (Figs. 14 and 15). Obliterative endarteritis was only occasionally found in the examination of the series of seventy-eight cases) and in one case it was particularly well illustrated.

In another senile uterus, *Gyn. Path.*, No. 458, this process was still in an earlier stage. Only a few vessels were entirely obliterated, but all displayed narrowing of the lumen. The patient was fifty-seven years of age, and had eight children. Menopause ten years before the operation. The myometrium measured 10 mm., the endometrium 0.75 mm. No increase in connective tissue was evident, but the elastic tissue was very much increased, especially in the outer third. All vessels were made up, almost entirely, of elastic tissue; and almost all were surrounded by it. Proliferation of fibroblasts appeared in the intima, which caused the narrowing of the lumen. Findley, 1905, described obliterative endarteritis, differentiating it from the other changes, which, undoubtedly, are the result of subinvolution, but were not well understood at that time.

From these findings the features of a senile uterus of a woman who has borne children consist chiefly of an atrophic endometrium, atrophy of the muscular elements, marked increase of elastic tissue in the outer third, and within and around all vessels of all the zones. There is also distinct obliterative endarteritis; but no increase in fibrous tissue. In the nulliparous uterus of the senile type, judging from my specimen, the same process takes place; only instead of the increase in elastic tissue, these is just a hyaline change of the connective tissue and of the muscles of the media of the blood-vessels. The elastic tissue in such an uterus is present in so small an amount that, in its degeneration, it does not show itself conspicuously. At a later stage than that shown in my specimens, the elastic tissue must finally become absorbed; and, as a late process, calcification may be found.

CONCLUSIONS.

1. In general my views coincide with those of Shaw. The pathological classification of Shaw; namely, chronic subinvolution, chronic metritis, and hypertrophy, is an ideal one. A large percentage, over 85 per cent., may be placed in one or the other of the above groups. In a small percentage, however, there is a distinct overlapping which concerns, chiefly, the groups of chronic metritis and chronic subinvolution. In my series 12 per cent. of the cases were classified as a combination of these two conditions.

2. Chronic subinvolution alone is by far the most frequent cause of enlarged uteri, causing hemorrhage, pain, or leukorrhea.

3. The thickness of the uterine wall is due, in order of their importance, to an increase of the elastic tissue, edema and liquefaction of the connective tissue, and hypertrophy or enlargement of the individual cells.

4. Chronic metritis, as a true inflammatory condition, does exist; it is frequently responsible for the symptoms in these enlarged uteri.

5. Chronic metritis, locally, is never a primary disease; it is secondary to chronic endometritis, chronic salpingitis, or chronic inflammation within the pelvis.

6. Chronic subinvolution and chronic metritis may coexist in the same uterus.

7. Hypertrophy of the uterus has a pathologic basis of its own; it may occur in the multiparous as well as in the nulliparous uterus.

8. Chronic pelvic inflammation is seen occasionally only in connection with chronic subinvolution; and, therefore other factors

must play a greater rôle in the production of this condition. In the thirty-eight cases of my series, there were only six that showed inflamed appendages. Only seven had chronic endometritis.

9. The thickness of the wall, in the majority of cases of chronic metritis and chronic subinvolution, is due, partially, to the increase of the musculature.

10. The term "chronic metritis," used clinically, should be abolished. The term chronic subinvolution might be substituted in cases of multiparous uteri, which are definitely enlarged, and cause symptoms without evidence of pelvic inflammation. This would probably include over 80 per cent. of uteri which, pathologically, show signs of chronic subinvolution. The term chronic metritis might be applied to those cases in which there is evidence of pelvic inflammation, in connection with a more or less, immovable uterus. This would, in all probability, embrace a greater portion of cases of true chronic metritis, as well as those in which there is a distinct overlapping of both conditions.

In addition to placing a majority of these cases, clinically, in a class descriptive of their pathology, is there any other advantage in using the term chronic subinvolution? In my opinion, there is. The frequency of its occurrence will constantly be impressed upon the observer. The condition, of necessity, must result from a lack of involution of the puerperal uterus; therefore its prevention lies in the proper care of patients during pregnancy, labor, and the puerperium. Many patients have the opportunity of such care. Some take advantage of it, others do not; and some are not able to avail themselves of it. However, the combination of an intelligent and obedient patient, and a conscientious obstetrician will do much to reduce the frequency of this rather common clinical condition.

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IN MEMORIAM.

EDWARD T. ABRAMS, A. M., M. D., F. A. C. S.,

BY

G. VAN AMBER BROWN,

Detroit.

The greatness that belongs to true integrity of character and uprightness of life brought Dr. Abrams success and respect in his profession; fine cheerfulness and rare sympathy gained him the love of those who knew him. During the latter years of his life, I enjoyed a close friendship with him. An hour spent in his company never failed to give me the real pleasure and the uplift that comes from contact with a buoyant and superior personality.

Dr. Abrams' parents, Michael Abrams and Lydia (Chegwyn) Abrams, were born in Cornwall, England. He was born in a miner's cabin in Eagle River, Michigan, November 20, 1860. His early life was a period of hard struggle to gain an education. Between the ages of thirteen and eighteen, he was apprenticed to a blacksmith; he then began to teach at a country school in order to earn the money which would enable him to go to college. After obtaining a Bachelor of Science degree at Valparaiso, he attended Dartmouth Medical School, from which he was graduated in 1889. Later he did postgraduate work at Long Island College Hospital, and in 1902 Olivet conferred on him the honorary degree of Master of Arts. The doctor began his practice in Centennial, Michigan, and later removed to Dollar Bay, where he spent the remainder of his life.

In 1890, he was married to Ida L. Howe, of Howell, Michigan. One child, a daughter, was born to them, but died in early infancy. He is survived by his wife, several sisters, and two brothers, one of whom, James Abrams, is a physician at Calumet, Michigan.

All that Dr. Abrams achieved of success and skill was gained through his own tireless energy and his great capacity for hard work. Any project or enterprise, in which he was active, benefited by his interest and enthusiasm. Keen vision and quick comprehension

EDWARD T. ABRAMS, A.M., M.D., F.A.C.S.

BORN, NOV. 20, 1860. DIED, MAY 20, 1918.

made for improvement and efficiency in whatever he undertook. A man of broad generosity, he gave freely of himself, both in private charity and public service.

In 1907, he was elected to the State legislature. His legislative experience and knowledge of parliamentary procedure made him the backbone of all medical legislation in the State. Appreciation of the fairness of his nature was shown, when in 1913, during the copper miners' strike, the State appointed him as intermediary between agitators and employers. He was a politician of high type, straightforward and relentless in his pursuit of right. Nothing could stop him when on the trail of error, if he believed his action would be beneficial. It was said of him that he had stopped more detrimental and furthered more useful measures than any other medical man in Michigan. These same characteristics were not only evidenced in State affairs, but had an influence national in scope.

In much demand as a public speaker, he rarely spoke at length, but always with a wonderfully earnest manner and a masterful delivery. His knowledge of history, combined with his enthusiasm, made him a most interesting speaker. Without doubt he was the best authority in the state on Cornish history, beliefs and customs. In short, he was ever loyal to the spirit of his ancestry. Dr. Abrams was the owner of a fine medical library with full files of about twenty periodicals.

He was intensely patriotic and had been very actively so since America's entrance into the war. At the time of his death, he was President of the local chapter of the Red Cross, member of the Council of National Defense, and, as acting President of the State Board of Health, was much interested in Camp Custer, and made frequent visits there.

Physically, Dr. Abrams was rather small, but extremely wiry and active. At one time he was fond of wrestling, and very proficient in the art. His fingers were remarkably slender and quick in the most delicate operations.

Edward T. Abrams, besides being a member of the American Association of Obstetricians and Gynecologists, belonged to the A. M. A., was a member of the F. A. C. S., the state and local medical organizations, charter member of the A. K. K., one of the oldest medical fraternities; also member of the American Society of Social and Political Economics, and the American Geographical Society.

He was surgeon to various railroad and mining companies in the Upper Peninsula; consulting surgeon and lecturer on gynecology

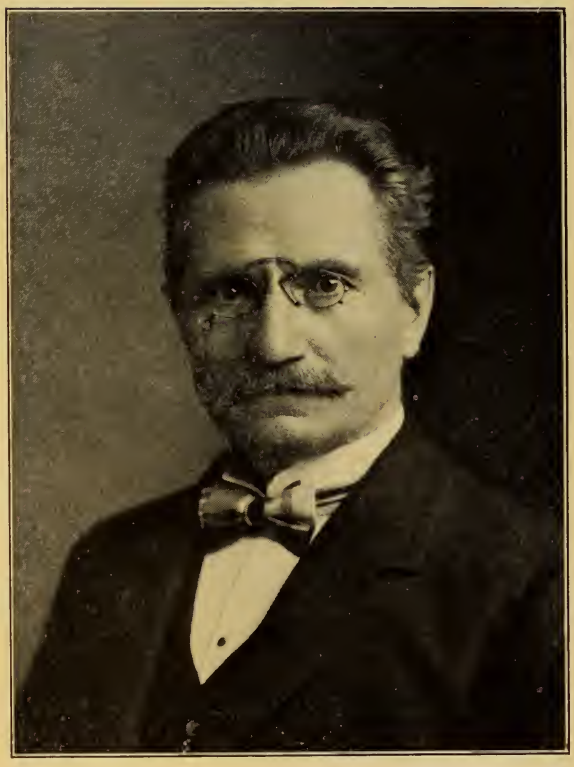
and obstetrics at the Lake Superior General Hospital, Lake Linden; surgeon in chief to St. Joseph's Hospital at Hancock.

His last appearance in public was in addressing a gathering for the Red Cross the evening before his death. His talk was masterly and full of feeling. It was remarked that he spoke from first to last as one inspired, as one apart and looking on.

His death occurred suddenly, shortly before midnight, May 20, 1918, after an evening spent in study in his library.

Physical toil and mental struggle filled his early years; his later life was characterized by energy and persistence. It is fitting that his death should have occurred as it did, in the midst of his activity and usefulness. One is reminded of Browning's lines:

"For the journey is done and the summit attained,
And the barriers fall,
Tho a battle's to fight ere the guerdon be gained,
The reward of it all.
I was ever a fighter, so, one fight more,
The best and the last!
I would hate that death bandaged my eyes, and forebore,
And bade me *creep* past."



FREDERICK BLUME, M.D.

BORN, FEB. 5, 1850. DIED, APRIL 14, 1918.

FREDERICK BLUME, M. D.

BY

DR. X. O. WERDER,

Pittsburgh, Pa.

Dr. Frederick Blume, after a lingering illness, died in Pittsburgh, April 14th, of this year. He was born in Hanover, Germany, February 5, 1850, graduated at the University of Goettingen in 1877, and came to America in 1880. He located at once on the North side of Pittsburgh, at that time known as the City of Allegheny, engaging in general practice in which he was eminently successful. Very early in his career he became recognized as a skilful and accomplished obstetrician, and his discussions and contributions on that subject before the Pittsburgh Obstetrical Society, of which he was one of the most active members during its entire existence, were always of much practical interest and value.

In 1885, he took a postgraduate course in Berlin under Carl Schroeder, at that time the leading and most progressive gynecologist of Germany; he remained in that city for a number of months attending the various gynecological clinics. Shortly after his return to Pittsburgh he was elected gynecologist to the Allegheny General Hosptial, a position which he held up to the time of his death. In his work he was very enthusiastic, and faithful in his duties at all times; even during the last few years of his life when his failing health often made it difficult to keep his appointments, and when his operative work became at times exceedingly trying to him, he persisted, in spite of repeated warnings on the part of his friends and his physicians, to give his service to the hospital. It was my privilege to observe him frequently when making his rounds through the wards, and I was always greatly impressed by the kindness and tenderness shown by him to the poorest and humblest of his patients. He was very thorough in his examinations, and his diagnostic ability was generally recognized as being considerably above the average, not merely as a gynecologist, but also as an internist. While not a brilliant operator, he was very painstaking, exceedingly careful in all details, and very attentive

and watchful in the after-care of his patients, so that his results compared very favorably with those obtained by most surgeons.

In a large frame of body he carried a heart full of kindness and gentleness, qualities which all those who knew him intimately recognized and greatly admired. He was a "home man," thoroughly devoted to his wife, and greatly interested in music, he himself having been quite a skilful pianist.

He became a Fellow of the American Association of Obstetricians and Gynecologists in 1892, and was for many years a regular attendant at the meetings. His papers, which he contributed at frequent intervals, were always well prepared and gave evidence of thorough knowledge of his subject, deep thought, and ripe experience. During the past few years he was unable to attend the meetings on account of failing health; the Pittsburgh meeting was the last one at which he was present. For a number of years he suffered from a cardiac lesion and arteriosclerosis, but the immediate cause of his death was general carcinosis of the abdominal viscera.

LEWIS WATSON SMITH M. D.

BY

EDWARD A. WEISS, M. D.,

Pittsburgh, Pa.

Dr. Lewis Watson Smith was born in Alliance, Ohio, March 12, 1873. After attending the local public schools, he entered Gettysburg College, where he graduated with the degree of A. B. in 1897. He entered the Medical Department of the University of Pennsylvania, and graduated in 1901.

After serving an interneship in the Allegheny General Hospital for two years, he entered general practice in Pittsburgh, where he established a large general practice. He became associated with Dr. Frederick Blume, as his assistant, in the Gynecological Department of the Allegheny General Hospital.

While specializing to a great extent, he practiced general medicine and surgery in Pittsburgh until the time of his death. His quiet, genial personality made him popular with his patients, as well as his fellow practitioners, and he always took an active interest in local medical affairs.

Dr. Smith was elected a member of this Association in 1913, and while his contributions to medical literature were few in number, yet he was a good student and a conscientious member of the profession. His illness was of several months duration, and the ultimate cause of his death was streptoccocic blood stream infection.

MARTIN STAMM, M. D., F. A. C. S.,

BY

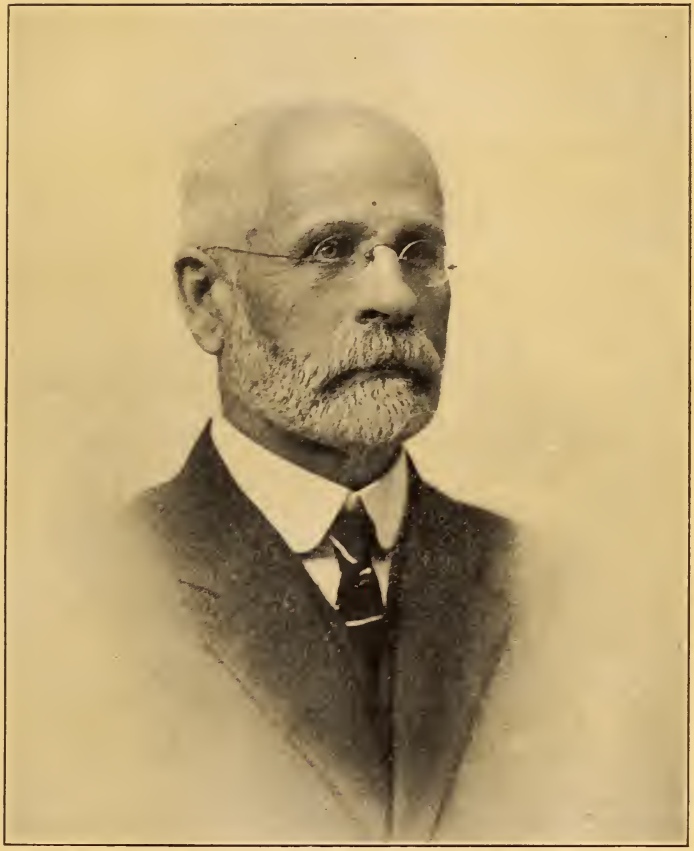
J. H. JACOBSON, M. D.,

Toledo, O.

On May 22, 1918, occurred the death of Dr. Martin Stamm of Fremont, Ohio. To the medical profession of Fremont and northwestern Ohio the day marked the passing of one of their most honored and renowned colleagues; to the laity it marked the loss of their most beloved physician and distinguished citizen, a man who for nearly half a century had been not only their physician and surgeon, but their friend and counselor as well.

Dr. Martin Stamm was born November 14, 1847, in Thoygan, Canton Schauffhausen, Switzerland. He graduated from the University of Berne, Switzerland, March 12, 1872. In the same year he began the practice of medicine in Fremont, Ohio; in this locality he practiced until his death.

In the history of American surgery we have many examples of brilliant physicians who have risen to national fame in spite of the handicap of living in a small community away from the large medical centers. Dr. Stamm was an example of this type of pioneer surgeon, who by sheer pluck, ability, and hard work attained a fame which would have been a credit to one surrounded by the facilities and conveniences of a large city. An ardent student by nature, thoroughly acquainted with German and French medical literature, he was able always to keep abreast of the times and to quickly put into practice any important advancements made in his chosen profession. For this reason to Dr. Stamm belongs the credit of having first performed many of the major abdominal operations in Northwestern Ohio. Dr. Stamm contributed frequently to surgical literature; a partial list of his publications is appended to this brief review of his life. The perusal of this list demonstrates the range of his surgical studies. In 1894, Dr. Stamm published his well-known method of gastrostomy. The operation consists of a series of purse-string sutures superimposed in the anterior wall of the stomach, by which a fistulous tract into the stomach is formed and



MARTIN STAMM, M.D., F.A.C.S.

BORN, NOV. 14, 1847 DIED, MAY 22, 1918.

through which a catheter can be introduced. By the use of the Stamm method regurgitation of food following gastrostomy is prevented. This operation has stood the test of time, and although to Dr. Stamm belongs the credit of priority in its publication, it is known in the surgical text-books as the Stamm-Kader gastrostomy.

It was Dr. Stamm who first suggested to the writer the idea of ligation of the upper pole of the thyroid gland as a substitute for the operation of arterial ligation in severe cases of Basedow's disease. This idea was later elaborated and published, and is now known as the Stamm-Jacobson operation, a method which has entirely supplanted the older methods of ligation of the thyroid vessels. It was Dr. Stamm who introduced Kocher's herniotomy into this country, and who did much to popularize Dührrsen's vaginal Cesarean section for eclampsia; he was one of the first to do thyroidectomy.

As a surgeon, Dr. Stamm was well trained, his foundation work was thorough; he possessed an accurate knowledge of embryology, anatomy, physiology, and pathology. For this reason he was quick to recognize new methods and equally quick to reject those which were not based on accurate scientific principles. As a diagnostician, he possessed remarkable ability, the result of long years of study, close clinical observation, and experience. There was scarcely an operation in the whole range of surgery which he h d not performed many times. Dr. Stamm made frequent visits abroad, and was well known in many of the large clinics, especially in those of his native country. In one of his last visits in 1914, he was made temporary chief of the surgical division of the Inselspital Clinic in Switzerland. He was for many years a Professor of Operative and Clinical Surgery in the College of Physicians and Surgeons in Cleveland; he organized, and for many years was president of the Sandusky County Medical Society; he was a member of the local, state, and national medical associations, as well as a Fellow of the American College of Surgeons. He was for seventeen years a Fellow of the American Association of Obstetricians and Gynecologists. Throughout his career he lacked the advantage of doing his surgical work in a modernly equipped hospital. He established his own hospital, but discontinued it on account of ill health. It is to be regretted that he did not liv to see finished the present new Fremont Hospital which is nearing completion.

As a colleague, Dr. Stamm was without a peer; his remarkable personality, his genial disposition and keen sense of humor, his broad view of life, the entire absence in his nature of any personal animosity, endeared him to all who knew him. His loss to the

medical profession was a great one, and his words of encouragement and instruction to the members of our profession will be greatly missed. As long as the present generation of physicians shall live Dr. Stamm's name will be revered by them as one of the earliest pioneers in American surgery and one who contributed his share toward the advancement of the science of surgery.

It was not only in the field of medicine and surgery that Dr. Stamm was well known. He was actively engaged in all public matters pertaining to the welfare of his community, possessing advanced ideas regarding educational and municipal affairs. At a memorial meeting held recently in Fremont in honor of Dr. Stamm his lifelong friend, the Honorable John T. Garver, said of him:

"Dr. Stamm worthily filled some important public positions. He was elected to the Fremont Board of Education three terms; to the office of the Board of Public Service where his influence was great, especially on the larger matters affecting the public safety, health, and general welfare. At the urgent solicitation of leading citizens of all political parties, he became a candidate for and was elected to the office of delegate to the Ohio Constitutional Convention in 1912. He received an unprecedented majority, and gave to the work his best thought and his great ability, especially on the most important proposals before the Convention. He addressed the Convention on some of the vital proposals, especially on the subjects of the abolition of capital punishment. This address was perhaps his best. He said 'This question has been ventilated from the standpoint of the lawyer, the preacher, professors, and laymen, but very little has been said from the standpoint of the criminologist; that the anthropological study of criminals will bear fruit and secure a firmer basis for the question of responsibility as well as the method a nd form of punishment.' While this address was perhaps the shortest, it was the ablest delivered in the Convention, and revealed Dr. Stamm as one of the leading thinkers of his time. Dr. Stamm's address on the subject of Initiative and Referendum, his longest address, attracted the attention of people more than any other. In this address he said, 'Democracy will not recede; to her belongs the future,' a quotation peculiarly applicable at this time.

Dr. Stamm always took a leading part in all important public matters affecting his community, enjoying the friendship and confidence of ex-president of the United States, Rutherford B. Hayes; he was consulted by President Hayes on the subject of prison reform, a humane movement which the ex-president led after his retirement from the presidency. Dr. Stamm was for many years a leading member of the Birchard Library Association of Fremont, under appointment of the Common Pleas Court. Over some objection he started a movement some years ago for the improvement of the public roads of this county, and lived to see that work a general success. Dr. Stamm was a manly man, true always to his own con-

victions, a leading citizen of his community, and with the exception of President Hayes, did more than any other man to promote the fame of Fremont, Ohio."

Dr. Stamm was well-known as a traveler. In 1889, he made a tour of the world, returning in about one year; in 1907, he made another trip around the globe. As a result of his wide travels, his extensive knowledge of general literature, as well as of medicine and its allied sciences, he was a most pleasing and entertaining conversationalist. His many travels and his contact with prominent men of all countries possessed him with a great fund of information. Although in failing health for the past year, his activities in the practice of medicine did not cease, and his death was sudden and unexpected. He is survived by one daughter, Mrs. George W. Hayes of Fremont, and one son, J. Hans Stamm of Detroit, Michigan, his wife having died several years ago. We can profit much by the study of Dr. Stamm's life; his habits of industry, his tolerance of the faults of others, his honesty and congeniality, and his conscientiousness regarding the welfare of his patients will always be remembered.

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At the annual election of officers, the following were chosen for the year 1918–1919.

President: JOHN F. ERDMANN, New York.
First Vice-president: EDWARD A. WEISS, Pittsburgh.
Second Vice-president: H. WELLINGTON YATES, Detroit.
Secretary: E. GUSTAV ZINKE, Cincinnati.
Treasurer: HERMAN E. HAYD, Buffalo.
Member of Council: CHAS. L. BONIFIELD, Cincinnati.

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